EFFECT OF FINANCIAL REGULATORY REQUIREMENTS ON PROFITABILITY OF MICRO-FINANCE INSTITUTIONS IN KENYA

BY:

VALERIA ONSANDO

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF BUSINESS MANAGEMENT, SCHOOL OF BUSINESS AND ECONOMICS, DEPARTMENT OF ACCOUNTING AND FINANCE, MOI UNIVERSITY

OCTOBER, 2023

DECLARATION

Declaration by the Candidate

This thesis is my original work and has not been presented for a degree in any other University. No part of this thesis may be reproduced without the prior written permission of the author and/ or Moi University.

Signature…… Date……

Valeria K. Onsando (SBE/PGM/006/2012)

Declaration by the Supervisors

This thesis has been submitted for examination with our approval as the University Supervisors.

Signature…… Date……

Dr. Robert Odunga
School of Business and Economics
Department of Accounting and Finance
Moi University, Eldoret.

Signature…… Date……

Prof. Joyce Komen
School of Business and Economics
Department of Management Science and Entrepreneurship
Moi University, Eldoret

DEDICATION

I dedicate this first to Almighty God, the creator and giver of all things. Secondly, to my family for the support and encouragement accorded during my studies.

ACKNOWLEDGEMENT

First, I am indebted to Moi University for allowing me to undertake a Master of Business Management (Accounting), degree Programme. I also register my sincere appreciation to my supervisors, Dr Robert Odunga and Prof. Joyce Komen who guided me through the preparation of this thesis.

ABSTRACT

The Micro-finance industry has shifted from the purely social mission orientation to commercial enterprises with profit motive and regulation emphasises sustainability which can be achieved through profitability. The purpose of the study was to establish the effect of financial regulatory requirements on profitability of micro-finance institutions in Kenya. Specific research objectives were to determine the effect of quality of loan portfolio on profitability of MFIs, to examine the effect of capital adequacy on profitability of MFIs, to determine the effect of liquidity risk on profitability of MFIs and to examine the effect of number of branches on profitability of MFIs. The study adopted an explanatory research design. The target population were Thirteen (13) Deposit taking Micro-finance Institutions (DTMI) licensed by the Central Bank of Kenya. The study was premised on the Agency Theory as well as Public Interest Theory of regulation. Secondary data obtained from published financial statements for the periods 2010 to 2018 for all the thirteen Micro-finance Institutions was used. Data analysis was done using R software and panel data regression was done using ordinary least square method and tested using Lagrange Multiplier test. One-way fixed effect model was the most suitable model hence used for data analysis due to the unbalanced data. The results indicated that Capital adequacy had a negative impact of profitability with $\beta=0.005$; $p<.6.70e-05$ and $\beta=0.004$; $p<.0.035$ under individual specific and time effects respectively hence rejected the null hypothesis that capital adequacy has no effect of profitability of MFIs. Quality of loan portfolio had a negative impact on profitability with $\beta=0.001$; $p<.0.002$ and $\beta=0.001$; $p<.0.0002$ under individual specific and time effects respectively implying increase in PAR led to decrease on profitability. This too rejected the null hypothesis. Liquidity risk had a positive impact on profitability with $\beta=0.11$; $p<.0.031$ and $\beta=0.183$; $p<.5.77e-06$ under individual specific and time effects respectively which implied that a higher financing gap ratio resulted in higher profitability. The number of branches was insignificant under individual specific effects hence had no effect on profitability but significant under time effects with a $\beta=0.002$; $p<.0.001$. Inclusion of the control variables did not change significant variables both under individual specific and time effects models; and were observed not to be significant in explaining the relationship with profitability. In conclusion, the study established that the Micro-finance regulatory requirements have an impact on profitability. Based on the findings it is recommended that regulation be extended to credit only and other unregulated MFIs for them to benefit from regulatory requirements alongside installing financial discipline. The regulated MFIs should work towards implementing recommendations on variables under study to maximize profitability. The study recommends studies to be carried out with the inclusion of the non-regulated MFIs who represent a large market share of the industry. Given the high variability of liquidity risk on profitability, it is recommended that more studies be undertaken to cover other aspects of risk management on profitability of Micro-finance institutions.

LIST OF TABLES

LIST OF FIGURES

TABLE OF CONTENTS

OPERATIONAL DEFINITION OF TERMS

Capital Adequacy: The measure of capital levels that can support the business of Micro-finance banks.

Liquidity Risk: The inability of a bank to fund an increase in assets and meet both expected and unexpected cash and collateral obligations at reasonable cost without incurring unacceptable losses as they become due, without adversely affecting the bank's financial condition.

Micro-finance: Micro-finance usually refers to the provision of financial services to poor and low-income clients who have little or no access to conventional banks.

Number of Branches: The actual number of physical branches of Micro-finance banks licensed by the Central Bank of Kenya.

Profitability: This shows how well an organization uses its assets from its primary mode of business to generate revenues. It is the ability of a given investment to earn a return from its use.

Quality of Loan portfolio: The value and recoverability of aggregate of loans and advances made to the borrowers or appearing on the balance sheet.

Regulatory Requirements: All applicable laws, rules, regulations, orders, guidelines, or directives with any Regulatory Authority that should be adhered to.

LIST OF ABBREVIATION

AMFI	Association of Micro-finance Institutions
CBK	Central Bank of Kenya
CGAP	Consultative Group to Assist the Poor
DMFI	Deposit Taking Micro-finance Institutions
FSD	Financial Sector Deepening
MFI	Micro-finance Institutions
NSE	Nairobi Securities Exchange
NPL	Non-performing Loan
IMF	International Monetary Fund
PIT	Public Interest Theory
PAR	Portfolio at Risk
QLP	Quality of Loan portfolio
ROA	Return on Asset
ROE	Return on Equity
SME	Small and Medium Enterprise

CHAPTER ONE
OVERVIEW

1.1 Introduction

This chapter presents background of the study, statement of the problem, objectives of the study, research hypothesis, scope, and justification for the study.

1.2 Background to the Study

Micro-finance services are typically extended to economically active citizens and Micro-businesses that fall beneath the poverty threshold and have limited accessibility to conventional financial credits and services offered by traditional banks and financial institutions. (Jeanne Ofehand, 2017). Micro-finance clients generally consist of low-income entities that possess limited formal identification documents and lack formalised possession titles on the assets they own (Beck, 2015). Access to credit and capital is a significant obstacle for the impoverished; by granting them access to small loans, they can transition from poverty to a more prosperous future by investing in enterprises that generate profits. Micro-finance Institutions (MFIs) serve as a valuable complement to commercial banks by providing access to financial services for a substantial portion of the population that does not have banking privileges. As a result, they play a crucial role in expanding financial markets and ensuring that a substantial portion of the population has the means to obtain such services (CBK, 2018).

Initially Micro-finance focused on a social mission with the primary funding sources being grants and donations which were advanced to the poor population in society for purposes of economic empowerment. The industry has grown over the years and the

sources of funding has been diversified to include private capital. Over the course of the past ten years, there has been a trend among donors to prioritise funding for organisations that generate profits, on the theory that these organisations have a better chance of being operational over the course of the long term (FSD, 2012). The influence of Micro-finance is recognised by the governments of sub-Saharan Africa, which has resulted in the enactment of beneficial laws and regulations, the encouragement of investments, the opening of the business to foreign capital, and the improvement of police systems to safeguard clients (Njiraini 2015). According to Chikalipah (2017), approximately two-thirds of the general population of adults in Sub-Saharan Africa does not have access to formal financial services, as a result, the industry is gradually becoming the backbone of financial inclusion in this region. Recent research indicates that the Micro-finance industry has provided services to around 139 million low-income and underserved consumers, with a total loan amount of approximately $114 billion (Micro-finance Barometer, 2018).

Micro-finance in Kenya can be practised in a variety of ways, such as through regulated deposit-taking institutions, non-governmental organisations, church-based organisations, Merry go rounds, rotating savings and credit associations, accumulative savings and credit associations, and investment clubs (AMFI, 2018). Unregulated credit only Micro-finance institutions are on the rise with varied business targets ranging from agriculture to asset financing, while some are transforming from unregulated to regulated ones. On the other hand, the number of authorised Micro-finance institutions has increased dramatically since 2008, when the initial authorised Micro-finance Bank (MFB) received its licence. At the end of 2017, there were 114 MFB branches across the country, making the total number of licenced MFBs 13. However, a significant

decline in performance was seen throughout the course of the year 2017, as evidenced by a fall in net assets of 4.6 percent, from KSh. 72 billion in the month of December 2016 to KSh. 69 billion in the month of December 2017.

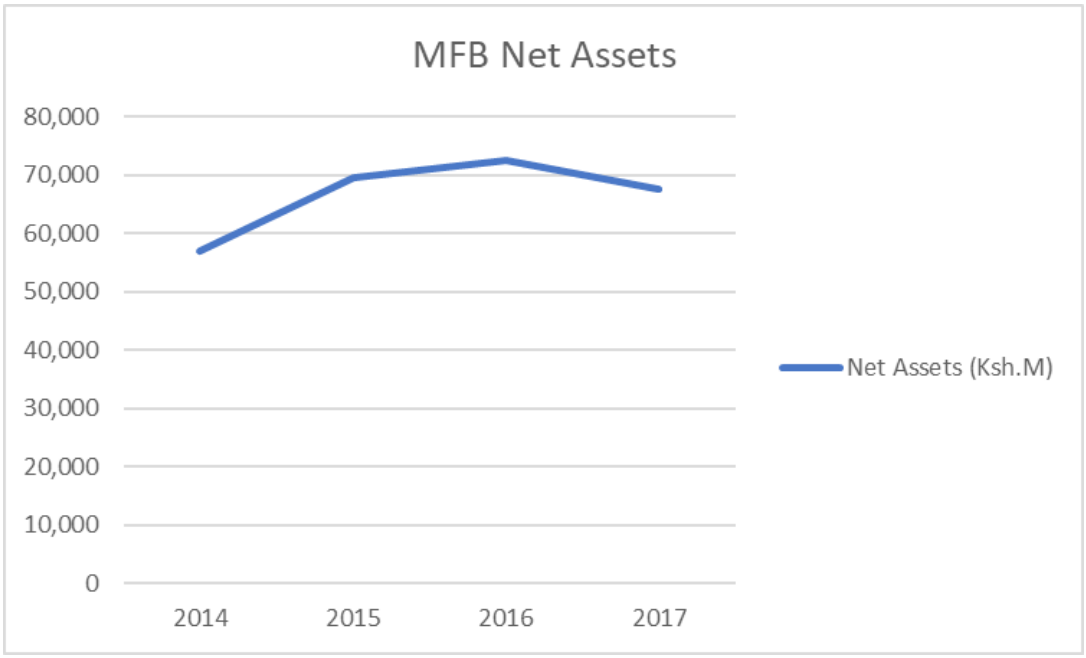

Figure 1 - Micro-finance Banks Net Assets (2014-2017)

Source: CBK (2018)

The profits within the industry experienced a decline, falling from KSh. 549 million in profit at the end of December 2015 to KSh. 377 million in deficit for the period ending December 2016 as well as KSh. 731 million for the period ending December 2017(CBK 2018). Uncertainty regarding financial income is the primary cause of the fluctuation in profits. To tackle the growing difficulties in the Micro-finance sector caused by its rapid growth and shifting dynamics of the market, which have affected the performance of the Micro-finance banking industry, the regulator has undertaken a comprehensive review of the Micro-finance Act (CBK, 2018). According to Cull et al. (2009), the exponential expansion of Micro-finance has generated growing demands for

regulatory oversight. However, Micro-finance institutions may find it particularly difficult to adhere to prudential regulations and the accompanying monitoring procedures.

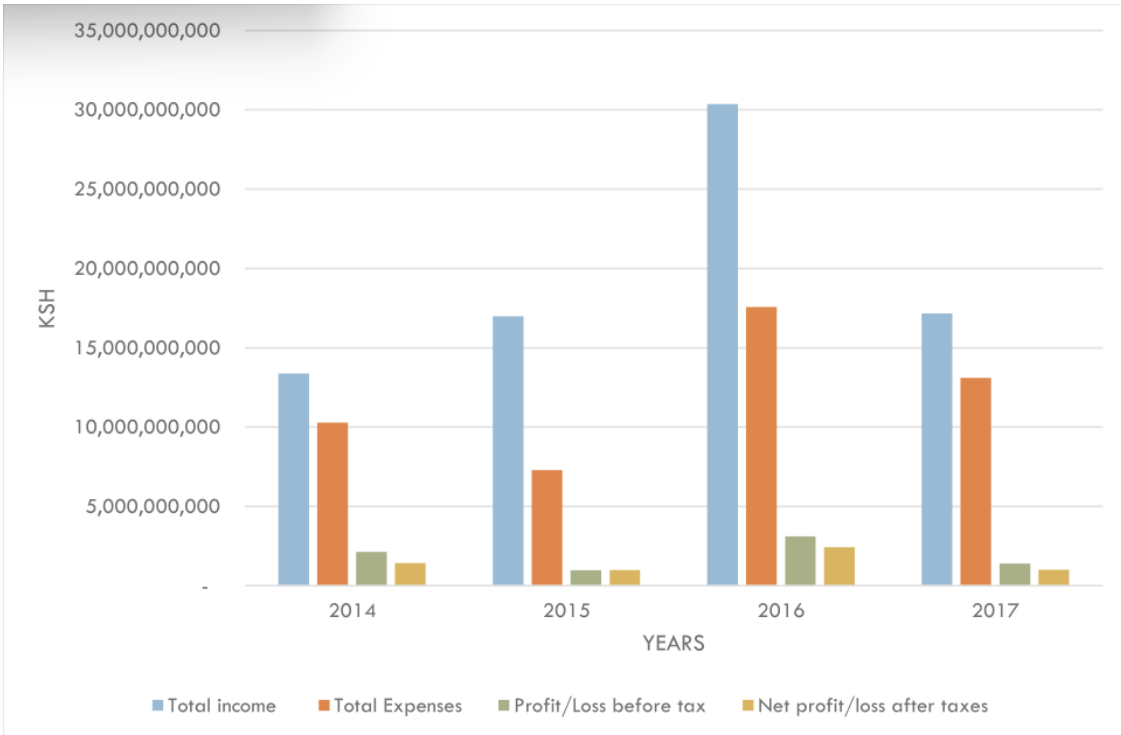

Figure 2- Micro-finance Banks Net Profit (2015-2017)

Source: CBK (2018)

As the micro finance industry was growing, over time they shifted focus to profitability at the expense of helping the poor and lowering the incidence of poverty (Rocha et al 2019). This resulted in mission drift in Micro-finance industry to commercialisation, which is in line with the Yunus philosophy that the Micro-finance sector is approaching mission drift by abandoning their primary social goal of strengthening the underprivileged in society and focusing more attention on meeting the financial aims (Abrar and Attiya 2014). The root of the arguments on mission drift is that when competition increases MFIs may move from their social mission and focus on striving

for financial returns (Abebe 2020). The focus of MFIs is affected by competition among various industry players which tends to divert from the original mission of social welfare to profitability and the need for returns as most of the MFIs are set up as business ventures.

Micro-finance organisations are faced with several challenges as they attempt to meet the double-bottom-line objective of providing financial services to those who are least fortunate while also covering their costs in a sustainable manner (Muriuki et al 2015). For successful transformation of MFIs, a combined strategy that considers both profitability and social benefit should be adopted. The social benefit focuses on poverty alleviation and social value creation while the commercial benefit focuses on profitability. In the middle of the continuum are the institutions seeking to fulfil both social benefits to society as well as economic viability, hence profitability. Therefore, Micro-finance ought to be understood not as a product but instead as a platform for providing both financial and non-financial services that are beneficial to those who are least fortunate in the world. Due to the fact that not every one of these non-financial products require to be profitable but instead socially oriented products and services, and the positive externalities, they create may attract clients, boost relationships, and enhance clients' capacity to manage follow-on loans (Casselman and Sama 2013).

Micro-finance institutions in Kenya are faced with challenges caused by the changing business environment ranging from ability to comply with regulatory requirements, emerging financial technologies, and the existence of unconventional players in the market. Further attaining profitability in a competitive business environment requires efficient management systems. According to Muriuki et al. (2015), commercialization is regarded to be a way of addressing managerial and efficiency challenges, and it is

also expected to encourage the enormous scale expansion as well as the sustainability of Micro-finance institutions (MFIs). Therefore, managers of Micro-finance institutions who find themselves under pressure to improve their financial performance must formulate policies that will allow them to change into regulated financial intermediaries so that they can access and utilize commercial sources of capital to improve their financial performance (Mbogo et al 2018)

1.3 Statement of the Problem

The regulation of MFIs in Kenya which took effect in the year 2009 introduced the need for commercial viability as reflected through the requirements to provide visibility study prior to licensing of deposit taking MFIs. Arguments have been fronted to show that transformation stagnated growth of Micro-finance institutions (FSD, 2012; AMFI 2018; Ombagi 2018; Rweria 2011). AMFI (2018), observed that the absence of a complete regulatory framework made it easy for business performance. However, profitability is key to financial sustainability and ability of MFIs to offer intended services. Borrowing from the arguments of Besley and Ghatak (2017) on their article “profit with purpose” MFIs are social enterprises because of the double bottom line concept, social sustainability as well as profitability. Therefore, there is need for a critical review of factors affecting profitability of MFIs.

Studies that have been undertaken on Micro-finance institutions in Kenya, they include Kathomi et al (2017); Interest rate regulations and sustainability of Micro-finance institutions in Nairobi County, Ajang J. et al, (2018); Chepchirchir and Otuya (2017); Influence of credit management on the loan performance among Micro-finance institutions in Kenya; Wafula et al (2017); Influence of financial performance on

sustainability of MFIs; Githae et al (2018) Influence of electronic banking on financial performance of deposit taking Micro-finance Institutions in Kenya; Bitok et al (2019) Influence of Financial Leverage on Financial Sustainability of Micro-finance Institutions in Kenya. Kioko et al (2017) studied the determinants of financial performance of MFBs in Kenya. The studies demonstrate that research has been varied in several factors and dimensions, but no significant studies has been specific on factors affecting profitability resulting from regulation from the central bank.

Additionally, the studies that have been undertaken have brought varied results on factors affecting profitability on the banking sector. Harelima and Uwibambe (2018) observed a significant relationship between the Central Bank of Rwanda regulations and the financial performance of commercial banks in Rwanda, measured by profitability. Alshatti (2016) studied determinants affecting profitability of commercial Micro-finance institutions and the results were that the factors identified affected profitability either positively or negatively. Abrar and Javain (2016), examined the impact of capital structure on the profitability of Micro-finance organizations and found that deposits increase the amount of debt in the organization's capital structure, hence contributing to the overall profitability of the firm. Eyigege (2018), conducted research on the effect that financial leverage, customer deposits, and adequate capital had on the financial and sustainable operations of a few chosen Micro-finance banks in Nigeria. Sustainability is defined by Eyigege (2018), as the capacity to operate profitably as a going concern without being wholly dependent on funds from outside sources. Findings were that there is no statistical evidence to suggest that the variables used have significant influence sustainability of the selected Micro-finance banks. These studies

were inconclusive on the effect of various factors on profitability and suggest that whether profitability is affected depends on variable measures being applied.

Further to the above research gaps, it was observed that despite the significant growth of the regulated MFIs, there was reported decline in profits in the years 2016 and 2017 attributed to uncertainty in financial income. It is worth noting that the key change in the regulated MFIs is deposit taking aspect. Olga et al (2019), reported inconclusive results on whether deposits impact bank profitability positively or negatively given that it depended on the variable measures applied.

Therefore, from the studies carried out it was clear that there was a gap to be studied on whether central bank regulations affect profitability of deposit taking MFI's. It is on these premise that the researcher sought to study the effect of financial regulatory requirements on profitability of Micro-finance institutions in Kenya. This study sought to fill the gap of limited literature to establish the effect of regulatory requirements on profitability of MFIs.

1.4 Research Objectives

1.4.1 General Objective

The general objective of the study was to investigate the effect of financial regulatory requirements on profitability of Micro-finance institutions in Kenya.

1.4.2 Specific Objectives

The specific research objective for the study were:

i. To determine the effect of quality of loan portfolio on profitability of MFIs.

ii. To examine the effect of capital adequacy on profitability of MFIs.

iii. To determine the effect of liquidity risk on profitability of MFIs

iv. To establish the effect of number of branches on profitability of MFIs

1.5 Research Hypothesis

i. Ho1: Quality of loan portfolio has no significant effect on profitability of MFIs.

ii. Ho2: Capital adequacy has no significant effect on profitability of MFIs.

iii. Ho3: Liquidity risk has no significant effect on profitability of MFIs.

iv. Ho4: Number of branches have no significant effect on profitability of MFIs.

1.6 Scope of the Study

The study covered all licensed MFIs as at 31st December, 2018. Data for each variable was considered for a period of 9 years from 2010 to 2018. The period 2010 to 2018 was chosen in order to augment the limited number of the Micro-finance institutions and at the same time due to the fact that reliable and consistent data for the institutions was available for those years. The agency theory was used to guide the study on the profitability goal of MFIs whereas the public interest theory was used to guide the study on the influence of government regulatory requirements on the behaviour of deposit taking MFIs.

1.7 Significance of the Study

The study provided more literature in the studies undertaken on Micro-finance industry. Researchers in Finance, Economics and Accounting would find the study helpful in understanding regulatory requirements in MFIs. This study would be helpful as one of

the primary sources of information for academics and researchers who are interested in research on MFIs, finance, investment, and public finance. Those who are concentrating on the financial performance of MFIs would consider this study valuable.

The research will be beneficial to different stakeholders in the Micro-finance sector. The regulators of Micro-finance institutions will derive information on how the various regulations affect the performance of Micro-finance institutions. These would help in assessing the effectiveness of such regulatory requirements and contribute to addressing the gaps in regulation which can be used whenever review of the regulatory framework is undertaken. Based on study results, the government will be persuaded to put up laws and legislation that help financial institutions to operate effectively. The Kenya Vision 2030 envisions an inclusive financial system that will serve the communities effectively.

The management and investors of various MFIs, both established and those that intend to establish or transform into Deposit Taking Micro-finance Institutions (DTMI) will benefit from the study by identifying possible factors that may affect profitability hence focus on how to address them to enhance viability of their institutions. This will enhance returns for their business. Other stakeholders in the Micro-finance industry including the association of MFIs will gain insight in the regulatory requirements of the industry and hence come up with viable proposals on how to best enhance the business operating environment of their member.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews research concepts, theoretical and empirical literature relevant to the study. In this case we determined what has already been studied and identified pote ntial relationships between concepts and research that has been done. The chapter also presents the conceptual framework that shows the relationship between profitability of Micro-finance institutions and the regulatory requirements.

2.2 Research Concepts

2.2.1 The Concept of Profitability

The goal of investing in business is to earn returns which in turn enhances sustainability as the earnings will keep the business as a going concern. Profitability represents the ability of an entity to earn profits. Profitability analysis is used to measure the productivity of capital employed and operational efficiency (Tulsian, 2014). Fine (1977), believes that the term profitability has numerous aspects, such as profit being the gap between revenue and costs, profit being the price of capital, and profit being the outcome of the incentive for forgoing consumption and the productivity of capital over the course of time. According to Zarah et al. (2018), profit is an indicator that show an increase in the economic capacity of a firm, even though it is not necessarily marked by an increase in the overall amount of cash in a period in real terms. This is because profit is a symbol which represents an increase in the economic

capacity of a company. Further, Fine (1977) claimed that the concept of profitability has several lives, the first of which begins with profit being described as a difference between revenue and costs and ends with this definition being rendered obsolete as a result of the competitive industry. After that, it is reinterpreted as the price of capital, which, despite the fact that it identifies profit with rent in the static economy, is the next step in the process. In the end, profit makes a comeback in an economy that is dynamic because it is the result of the reward for forgoing consumption and the productivity of capital over the course of time.

Profitability is defined from different dimensions but all focus on returns. The difference that exists between a company's revenue and its implicit total costs is what is referred to as its accounting profit, and it is determined by applying generally accepted accounting rules (GAAP). A company's economic profit, on the other hand, takes into account not only the implicit but also the covert costs connected with production, often known as the opportunity costs. Accounting profit is an important criterion to assess performance; however, it is not an accomplish criterion for decision-making. Therefore, an economic approach may provide an improved basis for estimating future investment resources. Vahid et al. (2013) came to the conclusion that since accounting profit has generally stronger evidence, it can be more accurate when compared to economic profit; however, economic profit takes into account every element, and it is more significant than accounting profit. Consequently, using both accounting profit and economic profit may beneficial.

The factors affecting profitability can be either internal or external to the organisation and they are affected by management decisions on operational, investment and financing activities. On the other hand, the efficiency of management is measured by

the ability of management to convert inputs to outputs at the least cost, hence profitability. The profitability of the company serves as a yardstick for evaluating the effectiveness of management; generally speaking, the higher the profitability, the better the management.; Toshniwal (2016). Muriu (2016), also linked profitability to management efficiency observing that a company's profitability can be used as a gauge to determine how well its management is making use of the resources it already possesses in order to grow its business and create value.

2.2.2 The Concept of Financial Regulation

The primary objective of financial regulation is to uphold the integrity of the financial system by ensuring investor protection, fostering market order, and advancing financial stability. Financial regulation serves multiple purposes, with the preservation of financial stability being its foremost objective (Quaglia, 2015). This may be accomplished through consumer protection and prudential regulation. Prudential regulation aims to preserve the financial soundness and liquidity of institutions and the wider financial system, while consumer protection regulation primarily centres on products (McKee and Brix 2010). Prudential regulation primarily concerns itself with ensuring the security and integrity of the banking system as well as non-bank financial institutions that accept deposits (Maimbo et al 2002). Historically, prudential regulators have adopted a bottom-up approach, with an emphasis on ensuring the security and stability of specific financial institutions (White 2014). In contrast, consumer protection aims to rectify the intrinsic information asymmetry that exists between financial service companies and consumers, while also addressing particular biases and vulnerabilities on the part of the consumers. However, prudential regulation also serves to safeguard consumers by acting to prevent losses incurred by modest, unsophisticated

depositors and by endorsing reputable service providers who can consistently provide dependable financial access (Brix and McKee 2010).

Failures and structural limitations of regulation in key financial markets facilitated consumer abuses and poor risk management by financial institutions, which assisted in transforming a localised housing slowdown into a worldwide financial crisis. Failures and structural deficiencies of regulation in significant financial markets contributed to the global financial crisis (Gelpern, 2012) However, regulation also has negative implications. White (2014), argued that downsides of regulation include the costs implicit in regulation versus potential benefit, that regulations increase the complexity of the financial system and the likelihood of instability, that rules may force a large number of financial players to behave in the same way, which can readily exacerbate systemic problems; and third, that in complex adaptive systems, all policy acts have unanticipated and potentially unwanted implications. Magdalena (2015), also observed that though the main aim of prudential regulations is to increase the stability of financial systems and economies they also tend to increase the risk-taking tendency of banks and encourage them search for higher profits.

Financial regulation has been observed to cover several areas. Mishkin (2001), the separation of the banking industry from other financial service industries; restrictions on competition; requirements for capital; risk-based deposit insurance; disclosure needs; bank chartering; bank examination; and a supervisory versus regulatory approach have been recognised as the nine fundamental forms of prudential supervision of banks. White (2009), recognised fundamental forms of policy interventions include controls on entry, capital requirements, limitations on economies of scale, restrictions on economies of scope and diversity, restrictions on price, liability insurance,

disclosure requirements, bank examinations, bank supervision and enforcement, and so on. This can be generalised as financial regulation focusing on entry, conduct of business, and exit of financial service providers to ensure market stability and consumer protection.

2.2.3 The Concept of Capital Adequacy

A sufficient amount of capital is essential for preventing financial instability and protecting financial institutions from experiencing financial outruns. In order to ensure that financial institutions are able to withstand unforeseen setbacks in their operations, regulators use minimum capital requirements as a prudential requirement tool. In the Kenyan Micro-finance Act (2006), under provisions relating to governance, the regulator requires that DTMFIs maintain minimum capital requirements as set out in the schedule. It is therefore imperative that DTMFIs seek to maintain adequate capital as defined in the regulations as well as determined by the respective institutions.

Capital adequacy is measured by comparing the capital held by an institution against its assets. This may either be the statutory capital measurement or institution-based measurement criteria, but the ultimate goal is to determine sufficiency of capital to cushion an institution from solvency risks. It is vital that banks have sufficient capital in order to safeguard their depositors from unanticipated events and to ensure the stability and effectiveness of financial systems. This is necessary in order for banks to be able to absorb any losses that may be incurred as a result of their commercial activities (Fatima, 2014). Adequate capital affects profitability given that financial institutions will have sufficient funds to undertake lending activities hence generate profits. Kombo and Njuguna (2017), conducted a study on the significance of capital

adequacy needs. They found that financial stability, credit risk management, and reduced vulnerability to liquidity shocks were found to have a significant impact on the capital requirement of commercial banks in Kenya. On the other hand, balance sheet structure and deposit insurance had only a moderate impact on the capital requirement of commercial banks in Kenya.

2.2.4 The Concept of Liquidity Risk

Liquidity risk basically arises from the asset side as well as the liabilities side of the balance sheet whereby liquidity risk will be affected by deposits held by the bank and the demand for such deposits on one hand and loans advanced to clients and the repayments or failure of customers to repay such loans when due. Liquidity risk management entails managing both the demand and supply side of funds and being aware of gaps in maturity dates of the assets and liabilities. The regulator stipulates minimum liquidity assets to be held by a licenced DTMF institution and guides that DTMFIs undertake liquidity risk management practices. A higher liquidity risk increased the probability of an institution being illiquid which may in turn reduce available funds for business and financial operations hence probability of lower profits.

The challenge in the banking system is that liabilities presented by deposits are of short term while assets presented by loans are long-term leading to mismatch in cash flows. Such mismatch likely to create the gap between the duration of assets and liabilities. Therefore, the focus of liquidity risk management will be on stability over the long term and profitability. This will be accomplished by maintaining liquidity requirements, controlling credit quality, and assuring sufficient operating capital. Additionally, a company must be able to measure and estimate the projected cash flows

for its assets and liabilities. The purpose of liquidity supervision and regulation is to limit the occurrence and severity of liquidity issues that are specific to individual companies, and as a result, to lessen the potential impact those issues could have on the overall financial system (Lopez, 2008).

2.2.5 The Concept of Quality of Loan Portfolio

Lending is the main business activity for banking institutions and loan portfolio is the largest asset and source of revenue whose performance has a bearing of their profitability. Quality of loan portfolio is determined by the recoverability of loans advanced within due time. In Kenya the regulator guides that a person who applies for a credit facility shall provide evidence of the ability to repay the loan, and further guides on determination, provisioning and reporting of portfolio quality. If loans are not recovered within due time, they are termed as PAR hence are deemed to have potential effect on cash flows as well as profitability. In agreement with the proponents of the portfolio theory, for Micro-finance institutions to maximise their return on investment in terms of a high-quality loan portfolio, they need to take precautions to reduce the amount of risk in their portfolios (Lopez 2018).

2.2.6 The Concept of Number of Branches

The regulator approves the opening of Micro-finance branches as part of the supervisory role by stipulating that no person carrying out deposit taking business shall open or close a place of business in Kenya without prior approval. This gives the regulator effective control of the MFIs. Established branches serve as service delivery avenues to Micro-finance clients which affects the ability the Micro-finance institution to offer its services. The MF regulations stipulate that no institution shall open,

relocate, or close a place of business without the prior written approval of the Central Bank. In this case, the 3rd schedule to the regulations provide guidance on opening a place of business including a branch while the 4th schedule guides on closure or relocation of an existing branch.

MFIs with more branches enjoys the benefits of large-scale operations compared to one with no or less branches. The number of branches of MFIs influences the breadth of outreach which is one of the social objectives of the Micro-finance industry, hence more branches may imply more client base, therefore increased sales volume which leads to higher returns. Branching also spreads risks across the branches hence maximizing on returns.it allows diversification of resources whereby one branch can serve as a deposit collection point whereas another serves as a loan advancing channel and allows for transfer of resources from one branch to another hence economy of cash reserves. Micro-finance branching therefore brings forth the concept of access and economies of scale which may influence profitability.

2.2.7 Size of Micro-finance Institutions

Different MFIs are varied in growth in terms of size. One of the ways to measure size is based on the number of assets held by the institution. With the assumption that clients are available in a competitive business environment, an asset base has a potential bearing in the profitability of MFIs given that it presents resources available for investing in available opportunities. This may also be because higher asset base may imply higher capitalization, better liquidity (if assets held are liquid), and availability of funds to invest in loan advancements or even capacity to expand in terms of establishing more branches. Kosumi (2021), observed that the size of total assets has a

positive impact on profitability. The results showed that large banks outperform smaller banks in profitability because of economies of scale and reduction in costs. Aladwan (2015), on the other hand observed a significant difference in the profitability of differently sized banks with results showing a contrary view that smaller and medium sized banks exhibited higher overall performance compared to larger banks.

2.2.8 Age of Micro-finance Institutions

Another aspect of viewing the growth of MFIs is in terms of age. The regulated MFIs were established at different times whereby some transited from credit only or non-governmental institutions while others were fresh startups. Key interest in a study by Rupa (2018) was the observation that mature MFIs with their long-life span had a wider asset base and recorded lower expenses whereas new (in this case less mature) MFIs are growth oriented and their allocation of assets to its lending activity is greater than the other age groups. This has a bearing on profitability while considered alongside capital, liquidity, loan portfolio and branches.

2.4 Theoretical Literature

A set of systematic, interrelated concepts, definitions, and propositions that are advanced to explain and forecast phenomena is known as a theory. Theories are typically developed to account for and explain complex phenomena (Cooper and Schindler, 2011). The study adopted theories that cover regulation and supervision of firms and profitability. These were the agency theory and the public interest theory of regulation.

2.4.1 The Agency Theory

Maximum sustainable profitability should be encouraged because healthy competition for profits is an indicator of an efficient and dynamic financial system (Van and Sonja 2020). Participants in banking business though with varying approaches are or focused addressing the risk of organisational failure. The agency theory presents a concept that seeks to address the problem of organisational failure that can result through the conduct of its agents. An agency relationship is defined as an agreement that develops when one or more people (principals) hire another person (agent) to execute specific service on the behalf of the principals, which may involve transferring a certain level of decision-making power to the agent (Jensen and Meckling's ,1976). Because shareholders have a right to profits, it is in the shareholders' best interest to maximise these profits, which can be accomplished by optimising the inputs used in the company's operations. This situation is however not necessarily achieved for all firms because of incentive problems or inefficiencies, hence the need for monitoring mechanisms.

The fundamental agency conflict in contemporary organisations stems from the division between ownership and management (Aboagye-Otchere et al., 2014). The agency theory posits that agents may not consistently prioritise the optimal interests of shareholders, but rather prioritise their personal self-interests as managers. This issue is worsened by the lack of complete and asymmetric information between the principal and agents (Urquiza et al., 2010). This results in agency costs, including the expenses associated with supervising managers, the expenses of preventing managers from acting against the interests of owners, and the residual loss, which is the wealth difference caused by principals not directly carrying out acts. The principal-agent

problems retain significant significance in the banking sector, especially due to the wide distribution of debt among a bank's deposit holders (Dewatripoint and Tirole 1994). Governments globally strive to develop a proficient financial services system, aiming to enhance efficient intermediation, safeguard depositors, foster effective competition, maintain public trust in the system, ensure its stability, and protect against systemic risk and collapse (Oladejo and Oladipupo, 2011).

Profits serve as a vital compensation for entrepreneurs who take on the responsibility of managing risk and uncertainty. It is the entrepreneur's duty to assume the risks associated with making company decisions (Knight 1921). The propensity for risk-taking is shaped by the conflicts that arise between management and investors (Jensen and Meckling 1976). Otero et al (2019) conducted a study to examine the impact of corporate governance and bank ownership on bank risk taking. They found that when good governance prioritises the interests of shareholders, it can result in excessive risk taking. This creates a conflict of interest between stakeholders who are concerned about the financial stability of the firm and those who are focused on maximising their own benefits. The level of risk can be heightened by the governance of the country, and a robust macro governance framework can encourage banks to take on more risks. This demonstrates the impact of bank regulation and law enforcement on the risks assumed by banks. It is important to acknowledge that, despite crisis countries having strong regulations on sharing information, the motivation for the private sector to oversee the risks of banks was not as strong. According to Swamy (2017), in a situation when decision-making is uncertain, banks tend to engage in risk-taking financial practises driven by their rational pursuit of profit. This leads to a state of increasing financial instability.

The compensation of directors and senior management is frequently linked to the company's size instead of its earnings. Managers are motivated to expand the company by reinvesting profits instead of distributing dividends to shareholders. In such instances, corporations may opt to allocate resources towards capital-intensive endeavours with relatively low anticipated profitability, perhaps resulting in a negative net present value. Jaggis and Thosar (2017) observed that banking scholars have recognised the risk-shifting motivations in finance and suggested that regulation should moderate compensation systems based on performance. In their study, Jaggis and Thosar (2017), found a significant correlation between CEO salary and the accounting-based return on assets (ROA) performance indicator in the finance sector.

The theory of profitability explains that profits are a necessary reward of the entrepreneur for bearing risks and uncertainties in a changing economy. The theory holds profits as non-contractual residual accruing to the entrepreneur for his non-transferable function of bearing uninsurable future uncertainty caused by competitors' behaviour, innovations, consumer behaviour, policy interventions, and natural disturbance among other factors (Akani and Akani, 2018). Hence moderation of the principal agent relations through various monitoring mechanisms seeks to ensure healthy profits with focus on organisational sustainability. The coercive powers of the state provide possibilities for the utilization of the state by an industry to increase its profitability (Stigler, 1971).

In modern business operations key business decisions are more often made by managers while the uncertainty of these decisions is borne by the owners (Sanyal 2019). It is therefore essential that the principal agent relationship be guided to enhance profitability hence sustainability (Chaudary and Adebayo (2014). The regulation of

financial markets is implemented to address the principal agent dilemma, which arises due to the presence of free riders in a firm's business operations. The challenge is in the investors' limited ability to oversee the board's actions. Therefore, implementing measures such as trade regulations, information control within companies, fair compensation, and mechanisms for addressing grievances can effectively mitigate principal-agent conflicts. Management risk taking behavior is guided by the regulatory framework in place which in turn will influence profitability of financial institutions like Micro-finance banks. Van and Sonja (2020) argued that profitability is a revealing indicator of a bank’s competitiveness and quality of its management.

Criticism has however been advancing on the agency theory. Kultys (2016) observed the simplistic and unrealistic premises which constitute the basis of the theory and suggested that additional factors be considered that shape the relationship between subjects in the agency relationship. Gloria et al (2012) It has been discovered that agents' behaviour can be influenced by honesty, loyalty, and trust. Additionally, intrinsic rewards might serve as an alternate means of controlling agents' actions, in contrast to the extrinsic rewards suggested by traditional agency theory. Kultys (2016), further argued for the need to understand the nature of the firm and interpretation of corporate law, according to which directors’ draws their power by law from the corporation as opposed to through delegation. Advancements in agency theory include the stewardship theory that assumes managers act for the organisation and accomplish goals of all stakeholders including their own and the social agency theory that takes into account institutional factors as well which together enables analysing various models of cooperate governance (Kultys, 2016). Focus on institutional context, and development of enabling relationships will thus provide a flexible approach to

corporate governance with focus on general organisation success will enhance profitability.

2.4.2 The Public Interest Theory of Regulation

According to the available research, there are two elementary school of thought when it comes to the economic theories of regulation. These schools are known as the Public Interest Theory and the Private Interest Theory. Hertlog (2010), stated that the PIT makes the assumptions that regulators possess adequate information as well as enforcement authority to efficiently advance the public interest, that regulators are benevolent and seek to serve the public interest, and that regulators possess necessary information and enforcement capabilities to effectively promote the public interest. The theory is predicated on two beliefs: first, that unrestricted markets frequently fail due to the existence of monopoly or externalities, and second, that governments are able to repair these failures in the market by regulation (Sheifer, 2005). These two suppositions form the basis of the theory. According to the public interest theory, regulators should serve as unbiased arbitrators who are free from outside influence and respond to the needs of the public by bringing about changes in market practises that are inefficient or unfair (Peltzman, 1976).

Though the theory cannot be attributed to any specific author, it has its foundations on the Pigou's welfare of economics which is grounded in the concept of creating the greatest good for the greatest number of people while assuming that economic and total welfare are positively related (Hantke-Domas, 2003). The Pigou theory relies on two fundamental principles: firstly, the government possesses the authority to employ its coercive capabilities to bestow advantageous benefits upon specific individuals or

groups, and secondly, the idea of cartels can aid in determining the demand and supply curves. Where the value of a cartel is higher, it will lead to a decrease in the elasticity of demand for the industry's products or services. Additionally, in markets where costs are high, the entry of new competitors will be delayed (Martins, 2009). Hantke-Domas (2003), however, noted that the Public Interest Theory encompasses two valid notions. The first perspective, advocated by Stigler (1971) and Posner (1974), posits that regulation aims to safeguard and promote the well-being of the general public. The second perspective, formulated by subsequent scholars, defines regulation as a set of concepts suggesting that when the market fails, economic regulation should be enforced to optimise social welfare.

Implicit in this regulation theory is the fact that regulation is aimed at protecting the public hence regulation that is based on this principle should aim at equipping the public with all the information relevant for decision making (Uche, 2001). Information asymmetry occurs when certain parties in a market possess varying levels of knowledge on the worth of products or services being exchanged, resulting in one side having more information than the other. The presence of information asymmetry can pose risks to the transaction, as the party with superior knowledge may utilise their informational advantage to the detriment of the less informed parties. Adverse selection occurs when one party possesses more comprehensive knowledge prior to the parties reaching a contractual agreement. With the information asymmetry the party with more information influences the terms of exchange, hence moral hazard. Market failures can thus be corrected by availing information to the public. The idea operates under the presumption that regulators have sufficient knowledge and enforcement tools at their disposal to promote public interests (Hertog, 2010).

The rationale for implementing prudential regulation on deposit-taking institutions is ju stified due to the characteristics of depositors, who are typically small in scale, geograp hically spread out, lacking in information, and unable to effectively exercise their contr ol rights or oversee managers (Hartarska and Nadolnyak 2007). Bank failure can resul t in a loss of trust in the entire banking system and a subsequent widespread withdrawal of depositors' funds from the system (Uche, 2001). Joskow et al. (1994)**,** emphasise the significance of bank regulation by noting that the banking business was the first Americ an industry to be regulated. This was primarily due to the necessity of a nation to exert at least some control over banking in order to manage its money supply and macroecon omic performance. The primary objective of regulation in the economic sphere is to sa feguard consumers from various market imperfections. Specifically, banking regulation and supervision aim to explicitly prevent banks from taking on excessively high risks th at could jeopardise the interests of depositors and savers as a whole (Heremans, 1999). Joskow et al (1994)**,** noted that the banking issues during the great depression occurred because the efforts to loosen price and entry controls in order to enhance the effectivene ss of capital markets were mistakenly accompanied by decreased oversight of financial management. This led to a distorted incentive system for banks and depositors, ultimate ly transforming unfortunate events in financial markets into a severe economic disaster at a national level. This necessitated more stringent regulation of the banking industry, aligning with the principle that regulation is implemented in response to the public's de mand for rectifying inefficient or unfair market practises.

The concept of government regulation has faced numerous objections, primarily stemm ing from three views. Firstly, it is argued that markets and private arrangements can eff ectively address most instances of market failures without requiring any government int erference. Furthermore, in rare instances where markets may not function optimally, p

rivate litigation can effectively resolve any conflicts among market participants. Additi onally, if both markets and courts are unable to provide flawless solutions to all proble ms, it is argued that government regulators are inept, corrupt, and influenced by special interests. Therefore, implementing regulations would only exacerbate the situation (Sch leifer, 2005). Regulation can be defined as a type of government intervention in econo mic activities that involves interference with the functioning of the free market. Accor ding to Keeler (1984), free markets have a strong aversion to any type of government in volvement and instead favour unrestricted market forces. Nevertheless, some individu als perceive regulation as beneficial since it is believed that government action can prot ect individuals from the potential harm caused by the uncontrolled forces of the market. According to Uche (2001), regulation fulfils various objectives for different interest gro ups at different times. The argument posits that the public good theory has not fully el ucidated the need for regulation due to the dynamic nature of the idea of 'public good', t he fluctuating interests of individuals and groups, and the potential interconnection bet ween individual and public good.

In order to address the observed deficiencies, alternative theories have subsequently bee n proposed. According to Stigler's theory of Economic regulation, which was propose d in 1971, regulation is obtained by the industry and is largely intended to serve its own interests. The government can utilise its authoritative authority to bestow significant p rivileges upon specific individuals or organisations. The economic regulations and res ulting market dynamics can be seen as a product whose distribution is determined by th e principles of supply and demand. Posner (1974) noted that Stigler transformed the u nderstanding of regulation by proposing an alternative perspective that challenges the P ublic Interest Theory of Regulation. Stigler argued that his theory is more precise and c an be more effectively examined and tested using empirical evidence. Furthermore, his

theory is based on the assumption that individuals act in their own selfish motives and d o so in a rational manner.

2.5 Empirical Literature Review

This section reviewed several studies which have been done on profitability of Micro-finance and related institutions and the effect of regulatory requirements on profitability.

2.5.1 Profitability of Micro-finance Institutions

Profitability is an essential requirement for the continued existence and prosperity of a company over a prolonged period, and it additionally serves as a crucial prerequisite for the accomplishment of a commercial entity's objectives other financial goals (Gitman and Zutter, 2012). In Kenya the regulation of MFIs envisions profitability as key through the requirement to provide feasibility study of anticipated returns in their application for licensing. Micro-finance institutions should seek institutional transformation, innovation, and adaptability in order to be profitable (Phillipe and Sebastian 2018). Lack of assurance for continued supply of donor funding for MFIs once the funding period is over lead to the insufficiency of the funding over time (Stewart et. al. 2010). MFIs hence need to have alternative sources of funds other than donor funds, and profitability is one such source of revenue.

The regulation of MFI institutions brought with it the application of market-based approach to the operations of Micro-finance institutions. Citing Olivares (2005), Deb (2018), observed that commercialization resulted into entry of new profit-driven MFIs leading to increased inflow of commercial funds into the sector characterised by

profitability, it increased competition in the market and that increased competition brought about challenges for Micro-finance institutions to balance social with commercial objectives to enhance sustainability. Similarly, Wondirad (2020), established that social and financial performances have a positive significant relationship whereby MFIs enhance their social performance by increase outreach which in turn boosts their profitability and sustainability probably because through competition sales volume are increased. Raimar (2007), noticed that the Micro-finance industry is going through a significant shift out of the conventional donor motivated framework towards an increased level of capital market participation; observed that a greater degree of shareholder engagement is not merely a key essential for narrowing the enormous funding gap of Micro-finance institutions, but it additionally provides investors an attractive dual nature opportunity for investment which connects both social and financial benefits.

Banking institutions by the nature of their business are faced with financial risks that may affect their profitability. The CBK (2013), defined financial risk as the likelihood that the results of an occurrence or action might cause about negative impacts on the institution's capital or earnings. These negative impacts could either directly or indirectly result in a loss of earnings or capital, or they could result in the imposition of restrictions on the bank's capacity to achieve its company goals. Chepchirchir and Otuya (2017), observed that profitability of Micro-finance institutions is affected by various risks including regulatory, operational, interest rate, and credit risks further noting that risk mitigation measures are set by individual MFIs in order to enhance operational efficiency which in turn is intended to affect profitability of MFIs. Marcelo and Jason (2013) observed that regulators limit the risk that banks are exposed to and

consequently limit their losses on risky assets. Monyi (2017), observed that Micro-finance institutions use a variety of methodologies to minimize associated financial risks regarding lending to the poor including solidarity group lending, progressive loan structure, immediate repayment arrangements, regular repayment schedules and collateral substitutes.

Several factors have been observed to affect bank profitability ranging from micro economic to macro-economic. Studies on microeconomic variables that are associated with banks include Onuonga's (2014), investigation of the impact of the internal determinants of profitability of Kenya's top six commercial banks. He found that bank size, capital strength, bank operation expenses, ownership, and the ratio of loans to assets are the most significant primary drivers of the profitability of a bank. Other studies on microeconomic factors that are specific to banks include the work of Onuonga et al. (2005), who examined the impact of external determinants; Toshniwal (2016) observed that profitability is affected by factors including capital structure, credit control, operating and financial leverage and cost control; Olweny (2011) found that factors such as capital adequacy, asset quality, liquidity, operational cost efficiency, and income diversification have a statistically significant influence on bank profitability. Yao et al (2018) noticed that bank profitability is strongly influenced by factors such as size, solvency, financial structure, operating cost, and labour productivity, while credit quality and operational efficiency have an adverse and significant relationship with bank profitability. Ongore and Kusa (2013), concluded that the financial performance of commercial banks in Kenya is primarily driven by decisions made by the board and management. Alshatti (2016) noted that capital

adequacy and leverage have a favourable effect on bank profitability, while asset quality has a negative effect.

Macro-economic factors on the other hand cover industry or general economic factors hence are external to the institution. Citing Nassreddine et al (2013), Onuonga (2014), observed that these factors are related to the economic and legal environment, where regulation falls within the legal environment. Yao et al (2018), observed that market power, and economic growth explains bank productivity while banking sector development, inflation, and industry concentration were found to be negatively and significantly related to the profitability of banks. Ongore and Kusa (2013), observed that macroeconomic factors have insignificant contribution on bank performance. Ashenafi and Kingawa (2018), and Imai et al (2012), established that economic conditions measured by GDP affected profitability. Bougatef (2017), observed a positive relationship between the bank profitability and the corruption level in Tunisia. Abraham (2017), observed that while the success of Micro-finance is linked to the economic performance of the various jurisdictions, regulatory and public governance also matters.

From the above, we observe that for MFIs to effectively realize their social impact objective, they need to be sustainable, and profitability is one of the ways enhancing sustainability. At the same time, we observe that there are several factors that affect bank profitability and these range from institution specific, industry and economic factors. At the control of the MFIs are the institution specific factors which are several and most of them are linked to regulatory requirements. The literature therefore demonstrates that there may be a relationship between regulatory requirements and

profitability, the nature and extent of which needs to be explored by looking at the individual factors.

2.5.2 Financial Regulatory Requirements and Profitability of Micro-finance

Financial regulations involve external controls upon financial institutions aimed at maintaining confidence, enhancing protection and stability as well as consumer protection in a financial system. The aim of regulation is to maintain stability and promote economic growth (Mweiga 2014). Regulation impacts the growth and stability of financial institutions by either influencing the day-to-day behaviour of financial market participants or by influencing how the financial system evolve structurally while the absence of effective regulation will affect financial systems whereby the systems are likely to be unstable leading to crises that can devastate the real economy (Spratt 2013). Avinash (2008) stated that the primary objective of financial regulation is to reduce systematic risks such as a global economic downturn. He pointed out that the regulation of the finance sector is driven by concerns about consumer protection and the fact that banking has a significant impact on the overall system. In Monyi's (2017), study, it was found that the regulator plays a crucial role in maximising the productive capacity of an economy by ensuring the presence of a robust Micro-finance system.

Regulatory organisations either enforce restrictions on the MFIs to discourage them from participating in excessively risky operations or offer a range of incentives to align their individual ambitions with their societal goals. (Micro-finance bulletin, 2015). Saaid (2015) classified this as preventive or protective. Preventive regulations are taken by external regulators as a pre-crisis measure to reduce the probability of failure of the

financial institutions. Regulations on entry requirements, capitalisation, and liquidity management as well as establishment of branches are preventive in nature as they limit participation in the Micro-finance business if not met. Protective regulations, on the other hand, encompass steps implemented after a crisis to prevent a sudden withdrawal of deposits. These procedures reassure depositors that they will have priority in accessing their cash from the financial institution in case of financial instability. According to Swamy (2017), the countries in crisis had less effective regulatory and supervisory systems compared to emerging countries. Swamy noted that the financial systems of numerous emerging countries were not significantly affected by the crisis because they had better regulation, supervision, and cautious practises.

While regulation may be beneficial as intended by the regulator, at times it comes with negative effects that may inhibit business growth or even lead to counterproductive outcomes. In a study on the governance of financial regulation, Ross (2010) observed that there had been a deliberate breakdown in financial regulation that contributed to the global financial crisis. The significant financial regulatory agencies consistently created, executed, and upheld policies that made the financial system more vulnerable and resulted in the inefficient distribution of capital. Micro-finance entities seek to transform into licensed and regulated financial institutions to access diversified commercial sources of funds to fund growth and outreach and ultimately increase long-term development impact. However, the cost of transformation, inhibitive regulatory requirements and ownership requirements deter or slow entities from seeking entry or transformation into regulated status (Kilonzo, 2012). Kitching et al (2015), It has also been noted that regulation has both positive and negative impacts on performance and creates conflicting effects on performance. These regulatory effects arise directly from

adjustments made to comply with regulations, as well as indirectly through interactions with stakeholders. The decision on whether to transform and/or seek regulation is subject to the capability of an institution to comply with the set guidelines as well as the perceived outcome of the regulation. Karimu et al (2019), in a study on whether competitive MFIs should be regulated observed that low competition increases credit risk among MFIs in sub-Saharan Africa, and regulation helps to reduce such behaviour as the level of credit risk is conditional on the level of competition. Ann-Marie et al (2014), on the other hand observed that the Micro-finance sector is affected by legitimization; that is the customer's perception of an organization's level of compliance and conformity with laws and regulations and how noncompliance is dealt with.

Several factors motivate institutions to seek regulation or transformation. Valentina and Denis (2007) observed that regulation does not directly affect performance in terms of improved financial results, but institutions collecting savings reach more borrowers, hence indirect benefit may be realized if regulation is the only means of MFIs accessing savings. Chikalipah (2018), observed a negative and statistically significant relationship between micro saving and financial performance of MFIs. This was attributed to the high operating expenses emanating from mobilizing and managing micro savings that could erode profitability. Whether regulations reduce or increase financial institutions' profitability is theoretically ambiguous (Hosonoet al, 2004). We therefore seek to establish how specific regulatory requirements affects profitability of Micro-finance institutions.

2.5.3 Quality of Loan Portfolio and Profitability of MFIs

The primary focus of banking organisations is lending, and their loan portfolio is the most valuable asset since it represents the largest operational assets and revenue source. However, certain loans become non-performing and thus have a negative impact on the financial performance of financial institutions (Nkuah E., 2015). In their study, Waweru and Kalani (2009) discovered that the majority of financial crises experienced by DMFIs are frequently linked to the significant buildup of non-performing assets, which make up a substantial portion of the overall assets of financially insolvent organisations. Monyi (2017) and Oganda et al. (2019), have also noted that non-performing loans have an impact on the financial performance of Micro-finance institutions (MFIs). Ajang et al (2018), found that there is a strong correlation between loan portfolio management and the profitability of DMFIs. Prasanth and Mary (2016), observed that non-performing assets is one of the determinants of the financial performance of the Micro-finance institutions thus the need to control the non-performing assets. This necessitates good loan portfolio management to enable maximum loans recovery.

Banking regulation advocates for viable credit management practices to minimise loan defaults which in the long run will affect financial performance. Baklouti (2013), observed that Micro-finance institutions lend to impoverished and low-income borrowers. Therefore, the lending terms should be simplified to ensure greater accessibility for the poor. However, it is important to observe that these borrowers often lack collateral, posing a significant risk to lenders in the event of default. Consequently, it is crucial to implement effective credit management practises. In their study on evaluating credit risk management practises and performance of commercial

banks in Rwanda, Sabeza et al. (2015), observed that numerous commercial banks worldwide have faced collapse or financial difficulties as a result of ineffective credit management systems. In their study, Bob et al (2017), found that using distinct credit allocation strategies and adopting effective risk management procedures enables MFIs to achieve superior performance in terms of high repayment rates, low portfolio at risk, and low default rates. In their study, Ahmed and Malik (2015), examined the correlation between credit risk management practises and loan performance. They concluded that credit risk management practises do indeed affect loan performance. In his 2016 study, Wakaria examined the impact of credit management on the financial performance of Micro-finance organisations. He discovered that a majority of Micro-finance institutions in Kenya are confronted with credit risk.

Several factors have been observed to affect portfolio quality or loan repayments. While examining factors that affect default among borrowers, Baklouti (2013), found that the default rates of borrowers are significantly influenced by their socio-demographic factors, previous involvement in microcredit loans, and previous credit history. In a study conducted by Yimga (2015), it was found that portfolio quality enhances as outreach expands, contradicting the prevailing belief that larger expansion results in heightened default risk. Ng'etich (2008), Abbas and Honghuli (2016), and Kariuki and Ngahu (2016), have noted that loan performance is influenced by interest rates. According to Belaid (2014), banks that have high costs, low capitalization, diversification, and small size are more prone to having a poor loan portfolio quality. According to Barongo and Mukoma (2019), there is a positive and significant relationship between portfolio quality and macroeconomic determinants, group leverage level, group capitalization, and group characteristic.

Just like any other business, Micro-finance institutions operate in a competitive business environment, with lenders varying from commercial banks to the various unregulated micro finance institutions. The problem stands in finding a way to maintain competitiveness while simultaneously enhancing credit quality, hence improving the return on bank loans and reducing the costs associated with failure (Khalid, 2012). In their study, Kar and Swain (2014), examined how competition affects the outreach, financial performance, and loan portfolio quality of MFIs. They found that greater rivalry in the Micro-finance sector results in a deterioration of loan portfolio quality. In their study, Kumar and Bali (2014) found that rivalry within the Micro-finance market can have a detrimental effect on the performance and portfolio quality of Micro-finance institutions (MFIs). Navin and Sinha (2019), aimed to establish a causal relationship between concentration and competitiveness in the Indian market. The study's findings revealed an increase in focus and a decrease in competition, which were linked to previous intense competition and recent regulations. These regulations emphasise the importance of regulators monitoring the activities of prominent MFIs and taking appropriate measures to maintain a healthy competitive the atmosphere in the Micro-finance sector.

Regulation of lending practices is guided by the credit risk practices of an organization. In Kenya, the regulator has specified that credit committees should set limits on lending exposure in line with the institution’s risk management practice and market conditions, aimed at enhancing sound and viable credit management for MFIs. Kumar and Bali (2014), noted that concerns of heightened competitiveness resulting in multiple borrowing, default crisis, exorbitant interest rates, and forceful loan recovery could have adverse consequences that can be mitigated through enhanced regulatory

measures. According to Butcher and Galbraith (2019), regulatory interventions are necessary to eliminate predatory lending and excessive debt among impoverished Micro-finance borrowers.

From the above literature, it can be deduced that credit management practices affect portfolio quality which in turn affects financial performance in the Micro-finance industry. Competition has been cited as one of the factors affecting bank lending practices which in turn tends to affect loan performance. This therefore means that regulation of loan portfolio quality may influence MFIs profitability.

2.5.4 Capital Adequacy and Profitability of MFIs

The nature of business of financial institutions as well as effect on citizens necessitates regulators in different jurisdictions to set capital requirements to help mitigate the risk of insolvency that may in turn affect the depositors or even have cyclical effect in the entire banking sector. Ofoeda et al., (2014) found that implementing capital regulation is an efficient method for improving the stability and profitability of the financial services sector. In a study conducted by Lotto (2018), the author investigated the influence of capital requirement regulation on the operational efficiency of banks in Tanzania. The findings revealed a strong and positive correlation between the capital ratio and the efficiency of bank operations. Referring to IOSCO (1989), Buttigieg (2012) observed that Capital adequacy standards promote trust in the financial markets and should be formulated to create a situation where a company can cease operations without causing harm to customers or disrupting the smooth operation of the financial markets. Having sufficient bank capital would decrease the likelihood of information-driven panics that result in liquidity crises. Additionally, implementing capital

requirements would decrease the expense of providing lender of last resort support by reducing the cost of differentiating between illiquidity and insolvency. (Admati et al, 2013), in De Nicolò 2016). Jamali (2020), observed that capital guidelines and supervisory structure can have significant effect on capital adequacy state, which in turn influences firm risk-taking behaviour. Ikpefan (2013), on the other hand noted that banks may prefer to hold excess capital to reduce the likelihood of falling under the legal capital requirements.

Several researchers have established a positive relationship between higher capital levels and profitability. In a study on determinants of bank capital ratio, Ahmad and Albaity (2019), established that high capital levels are held for banks to avoid the risk of falling below the minimum requirement. Posnaya et al (2018), observed that according to Basel III approach commercial banks must have sufficient capital to cover credit, market, and operational risks. Assibey and Asebso (2015), and Zhang and Jiang (2018), observed that higher minimum capital requirement and excess capital drive capital growth and increases risk taking activities. Ali and Okibo (2015), established that there is a strong and positive correlation between capital adequacy and financial performance. David and Muendo (2018), in their study found that adequacy of capital affects the financial performance of MFIs. The finding supported the findings of Muthuva (2009), which likewise concluded that the profitability of financial institutions is directly linked to the core capital ratio. Consequently, a rise in capital leads to higher anticipated profits by diminishing the projected expenses associated with financial difficulties. Lotto (2018) observed that the bank's reconsideration of their internal operations approach was affected by the heightened restrictions regarding capital needs. Okoye et al (2017), found a strong and statistically significant

correlation between capital adequacy and financial performance in a specific group of deposit money banks in Nigeria.

The use of regulatory capital adequacy measurement may fail to assure capital adequacy as intended as observed by several scholars. Ali and Okibo (2015), observed that as financial institutions try to meet the minimum capital requirements, the amount of money available for lending is adversely affected because it reduces funds available for lending which may compel financial institutions to borrow at high costs to both meet the regulatory requirements and to meet the demands of lenders. In a study on capital requirement, competition and stability in Africa, Odour et al (2017). It has been noted that higher levels of regulatory capital in African banking led to greater financial instability. This is because banks are using different internal risk assessment models, which enable them to underestimate hazards in order to maintain lower levels of regulatory capital. As a result, the entire banking industry becomes more exposed to risk. The minimum capital also depends on whether the financial institution is deposit taking or a credit (Mwai et al, 2017).

According to Micro rate's technical guide from 2014, the Debt/Equity Ratio is considered the most straightforward and well-known indicator of capital adequacy. This ratio assesses the institution's overall level of leverage. The optimal debt ratio is the one that minimises the cost of capital for the company and maximises its value, ultimately leading to the highest profitability (Kebewar 2012). Oyong (2016), established that capital structure has a significant effect on profitability. Doku et al (2019), and Boateng et al (2019), observed that bank capital structure measured as capital to asset ratio positively influences bank performance. Mujahid (2012) in Allaham (2015) noted a direct correlation between the elements of capital structure and

the performance of the banking sector. In their 2019 study, Mensah et al examined the impact of funding structure on the technical efficiency of banks in Ghana. They found a strong positive correlation between funding structure and technical efficiency, indicating that a well-structured funding system can enhance efficiency. Additionally, they discovered a negative association between internally generated money and technical efficiency, suggesting that relying solely on internal sources of financing can hinder efficiency. According to Mensah's analysis, banks that depend on capital from external sources incur greater expenses compared to those generated domestically, hence creating a burden on managers to provide results.

Danso et al (2020) on the other hand observed that financial leverage is negatively and significantly related to firm performance. Okoye et al (2017) It has been noticed that banks should refrain from relying too heavily on debt, as an increasing in the amount of debt in their capital structure raises the likelihood of experiencing financial difficulties and bankruptcy. According to Joseph et al (2017), Nwude and Antalechi (2018), and Habimana (2018), the degree of debt has an impact on financial performance. They found that there is an ideal debt-to-equity ratio, beyond which the additional value of using debt to finance capital decreases. It is important to acknowledge that banks possess greater leverage and lower asset risk compared to non-banking financial entities., Berg and Gider (2017) observed that capital structure choice is determined by asset risk. There is no universally accepted optimal capital structure for a Micro-finance institution (MFI) because reaching this conclusion is contingent on the specifics of the institution and is influenced by a wide range of factors. Both the internal elements, like the expansion of the loan portfolio and the mobilisation of

savings, and the external factors, like the legal framework, the availability of donors, and commercial lenders, are highly significant factors to consider (Anne, 2011).

From the above literature we deduce a relationship between capital adequacy regulations and bank profitability. To meet the capital adequacy requirements banks may seek borrowings to supplement internally generated funds. This should be done while considering the trade-off between risk and returns to strike the right balance to enhance profitability. Therefore, there is a relationship between capital structure, being the ratio of debt to equity and financial performance, which needs to be explored.

2.5.5 Liquidity Risk and Profitability of MFIs

The significance of liquidity extends beyond the particular bank, since a deficiency in li quidity at one bank can have widespread consequences throughout the entire financial s ystem (CBK, 2009). According to Odunga et al. (2013), commercial banks that have sufficient liquid assets are more likely to inspire confidence in consumers due to their a bility to meet short-term financial obligations. According to the guidelines provided b y the Basel Committee on banking supervision, financial institutions are required to bui ld a strong framework for managing liquidity risk. This framework should ensure that t he institution has enough liquidity to withstand various stressful situations. The source of this information is the BIS report from 2008. The Micro-finance regulations (2008) stipulate that each institution must strategically plan and allocate funds to meet its liqui dity needs within specific timeframes established by the organisation itself.

Research has been conducted on many industries to examine the connection between li quidity, specifically liquidity risk management, and financial performance. The finding s suggest that there is indeed a relationship between these factors. Odalo and Achoki

(2016), found that liquidity has a positive and significant influence on the financial perf ormance of agricultural companies listed in NSE. Samo and Muraq (2019), aimed to de termine the influence of liquidity and financial leverage on profitability for publicly qu oted textile firms and discovered a positive relationship between liquidity and profitabil ity. Scholz et al. (2015), examined the effect of asset liquidity on returns in the real esta te industry and observed that asset quality is a relevant pricing factor that helps explain variations in returns in real estate equity markets. Vintila and Nenu (2016), conducted a study to identify the relationship between liquidity and corporate financial performance and concluded that a decrease in liquidity level is not perceived as a risk factor for Rom anian companies.

Cash reserve requirements and capital adequacy for MFIs imposed by regulatory author ities in several countries have led to credit constraints since a major portion of their liqu idity is held up in these reserves thus affecting their financial performance. (Akenga, 20 15), hence determining the ideal liquidity level requires liquidity risk management. MF Is are required to maintain a minimum 20% of its deposit liabilities in the form of liqui d assets (Republic of Kenya, 2008). While considering David and Muendo (2018) who observed that liquid assets are associated with zero rates of return, we can argue that sin ce this amount of money is not available for lending, it has the potential of affecting the MFI's profitability negatively. Ariffin and Kassim (2014), examined the management o f liquidity risk in Islamic banks. They found that during the global crisis, banks had a re duction in their return on equity. Furthermore, investors who were associated with bank s that had higher liquidity risk anticipated and achieved higher returns on their equity.

The study conducted by Ali and Okibo (2015) examined the impact of Central Bank of Kenya Prudential Regulations on the financial performance of Commercial Banks oper ating in Kisii County. The findings revealed a significant and positive relationship betw

een liquidity management and financial performance. In their study, Bruno et al (201 8) examined the impact of liquidity control on market reactions and found that the impl ementation of early liquidity restriction leads to a decrease in anomalous returns. How ever, the impact on prices is less significant when announcements related to capital reg ulation are excluded. This suggests that markets do not view liquidity regulation as a co nstraint and that the peculiarities of individual banks and countries also play a role. In creasing the quantity of liquid assets or aligning assets and obligations decreases liquidi ty risk but also diminishes profitability (Meile et al 2012).

Shifting investments from short-term securities to long-term securities boosts a bank's r eturn, but it also raises its liquidity risks. Conversely, a high liquidity ratio suggests less risky and less profitable banks, as stated by the BIS in 2013. Kamau (2009) made a co mparable finding and contended that banks, by maintaining a substantial level of liquidi ty, incur the opportunity cost of forgoing potential investments that could yield signific ant profits. According to Wasiuzzaman (2018), SMEs that have low levels of liquidity depend on their profitability to generate cash flows and enhance liquidity. In contrast, S MEs with high levels of liquidity do not rely on profitability to improve their liquidity. In fact, increased profitability actually decreases their liquidity. In their study, Hlebik and Ghollani (2017), found that banks are vulnerable to liquidity risk due to the process of converting short-term deposits into long-term loans, which is a crucial aspect of their core business operations.

In their 2012 study, Arif and Anees examined the influence of liquidity risk on the profi tability of banks in Pakistan. They found that liquidity risk has a major impact on bank profitability, and identified the liquidity gap as a component that exacerbates this risk d ue to its negative correlation with profitability. The study conducted by Musiega et al (2017), found a positive and statistically significant correlation between liquidity risk, a

s assessed by the ratio of liquid assets to total assets, and performance, as evaluated by r eturn on assets (ROA). Bonfim and Kim (2012), noted that the ratio of authorised loan s to accumulated deposits serves as a comprehensive indicator of liquidity risk in banks.

In their study, Chen et al (2018), analysed the financing gap to total assets ratio, whic h represents the disparity between loans and deposits in banks. They observed that bank s with a higher financing gap ratio are required to utilise their liquid assets to cover this gap, resulting in a higher liquidity risk. In their study, Schuemann and Straham (2009) found that liquidity risk in the banking sector is mostly associated with transactional de posits, which have the ability to trigger runs or panics. The core banking activities that rely on the process of maturity transformation are highly vulnerable to liquidity risk. Th erefore, when assessing liquidity risk, it is important to take into account customer depo sits. According to Mix (2011), Anne noted that Micro-finance institutions (MFI) that a ccept deposits tend to have more profitability since deposits serve as a cost-effective so urce of equity.

2.5.6 Number of Branches and Profitability of MFIs

Financial service providers traditionally operate through branch networks to facilitate access to their services while in some cases, alternative delivery channels are used to compliment branch banking in order to enhance outreach. According to Adelowatan and Oshadare (2017), it is important for banks to prioritise branching activities in order to attract more consumers who will utilise different delivery platforms to enhance efficient and timely customer service. A study was conducted to examine the characteristics of Micro-finance banking services and their impact on financial inclusion in Kenya., Malenya and Kariuki (2017), observed that accessibility was influenced to a large extent by an organization having a large branch network among

other issues. Presbitero and Ravellotti (2012) observed in Alimukwamedola (2014), that decentralised banking systems and geographical proximity are crucial for credit access. This is because local bank branches enable personal interactions with borrowers, allowing for the collection of both factual and personal information.

Branches are commonly seen as a conventional method of improving the availability of financial services. In order to decrease expenses, enhance convenience, and expand their customer base, service providers are investigating alternate distribution methods such as Automatic Teller Machines (ATMs), mobile branches, agent networks, and Internet banking. (Ledgerwood and Kehman, 2013). While noting that new delivery methods that are technology based may exhibit greater economies of scale than traditional branching networks, Le and Ngo (2020), observed that access points like ATMs, bank cards and point of sale terminus can improve bank profitability. Prior and Mora (2019) conducted a study on the impact of establishing branchless banking partnerships on Micro-finance institutions (MFIs). They found that the branchless banking model improved the operational efficiency of MFIs but did not lead to an increase in savings.

The extent of a bank's branch network directly impacts its ability to reach a wider audience and provide financial services. A larger branch network implies greater accessibility to these services, which can subsequently impact the bank's financial returns. In their study, Adelowatan and Oshadare (2017), investigated the impact of branches on bank performance and found a direct correlation between the expansion of branches and the growth of assets. In a study conducted by Musyoki (2011), on the correlation between the extent of branch network and the financial performance of commercial banks in Kenya, it was found that there is a positive association between

the size of a bank's branch network and its financial performance. In a study conducted by Chikalipah (2019), the impact of expanding the geographic reach of branch networks on profitability was examined. The findings revealed a notable positive growth in profitability. However, it was emphasised that in order to preserve the benefits of economies of scale achieved through the expansion of the branch network, operational efficiency must be maintained. Calomiris (2006), observed that in the early 20th century, restrictions on branching in the USA hindered diversification and increased vulnerability. This resulted in lower profitability for US banks compared to Canadian banks, which were allowed to branch nationwide.

Other studies have indicated negative links between branch network and profitability, implying institutions with more branches may not necessarily be profitable. In their study, Mireku et al., (2018) examined the impact of bank presence on financial performance. They found that simply increasing the number of bank branches does not automatically lead to profitability. The researchers argued that the growth of bank branches does not improve alternative distribution channels of operations due to intense competition in the financial sector, high operational costs, and a low savings culture in Ghana. In their study, Lellissa and Kuhir (2018), found a substantial negative correlation between branch growth and bank performance. According to a case study conducted by Acosta and Ndonga (2014) on Musoni Micro-finance, the institution's branches are primarily utilised as a means of interacting with consumers, resulting in decreased expenses associated with establishing operations in distant regions. This is made possible by the organization's virtual operation on an ICT platform. These efficiencies are subsequently transferred to clients through reduced borrowing rates and to stakeholders through favourable investment returns.

The establishment of branch network should consider economies of scale in order not to be counterproductive. Micro-finance institutions should establish the optimum level of branches to yield highest return when considering the costs vs benefits of the branch networks. Aladwan (2015) in Adewatan and Oshadare (2017) observed that despite the advantages of expanding branch networks, there is clear evidence that there are significant costs associated with this expansion that would decrease the profitability of banks. On a study on whether branch network expansions influence performance of Japanese regional banks, Kondo (2017) observed that though more branches increased total loans and bills discounted by each bank due to increased contact with customers, returns for the banks with more regional banks was lower; thus, establishing too many branches that are too large can have a negative effect on the regional banks.

Creating a network of branches may be an expensive and time-consuming endeavour, which can hinder a bank's ability to grow its business, especially in the small and mediu m-sized enterprise (SME) and retail sectors. This is particularly true in places with pote ntial clients located in small towns and rural areas (World Bank, 2013). Ledgerwood a nd Lehman (2013) noted that traditional branches incur the highest operational costs du e to the requirement of essential infrastructure such as accessible roads, electrical powe r, Internet connectivity, and telephone access. Operationally, there are expenses relate d to personnel, security measures, backup power systems, internal controls, and other c osts associated with risk management and monitoring. According to a study conducted by FSD (2012) on the transformation of Micro-finance in Kenya, it was found that the process of establishing a branch was both time-consuming and expensive. This was du e to the requirement for Institutions to make expenditures in infrastructure, staff, and ot her costs in order to establish branches. The majority of the expenses are associated wi

th rigorous security measures that were deemed unnecessary since the monies kept by t he branches are insured, resulting in double expenditures for the amount of cash held. The deposit taking branch infrastructure and reporting requirements were expected to i mpede the establishment of DTMI (FSD 2012).

Branch banking has been recognised for its role in facilitating access to financial servic es, which aligns with the goals of Micro-finance. According to Seitzer's (2018) findin gs, the act of branching resulted in a higher level of capital accessibility and improved p rovision of banking services in rural regions. This occurred because branch banks had the ability to redistribute capital from urban to rural locations within their organisation. Gilje et al (2016) observed that branch networks still have a significant impact on finan cial integration, even with the existence of securitisation markets. They found that bank s with branch networks were more likely to engage in mortgage lending, particularly fo r mortgages that are difficult to securitise. Oliver (2018) examined the factors influenci ng changes in spatial accessibility to services as a result of bank branch closures during the great recession. It was observed that the closure of bank branches occurred due to a decrease in demand for bank services and the conversion of not-for-profit institutions in to profit-driven banks, which led them to abandon their social objective of promoting fi nancial inclusion.

Muthinja and Chipeta (2017)**,** conducted a study to analyse the factors that drive financi al innovations in Kenyan commercial banks, both at the business level and the macro le vel. The study specifically focused on branchless banking, which is a deviation from th e traditional branch-based banking model. The study findings suggest that branchless banking at the business level is influenced by factors such as firm size, transaction cost, agency cost, technical advancements, and firm limitations. Branchless banking is influ enced by several key factors at the macro level, including regulation, technical advance

ments, financial market incompleteness, and globalisation. In their study, Singh and P adhi (2019) examined the factors that influence the extent and scope of outreach of **Mic ro-finance** institutions (MFIs) in India. They found that age, assets, and productivity in dicators have a positive correlation with the outreach performance of MFIs.

Olsen (2017) conducted a study on the efficacy of human touch in a digital era and fou nd that although Kenyans are comfortable with performing digital transactions, other i mportant elements of the customer experience cannot be successfully addressed only th rough digital methods. Kenyan customers desire personal engagement to verify the aut henticity of the product, comprehend its features, and address any issues. Therefore, it i s essential to strategically utilise physical branches to facilitate the more sophisticated a spects of servicing value-added products, while also ensuring face-to-face assistance fo r customers who are unable to resolve problems through alternative means.

2.5.7 Firm size and profitability of MFIs

The size of MFIs can be measured from different dimensions, among them being the assets held by the institution. Different researchers have come up with varied arguments with regard to size and profitability. Aladwan (2015) undertook a study on the effect of bank size on profitability for Jordanian listed commercial banks. While classifying banks into different categories according to total assets held, the study showed that there was a significant difference in the profitability of these different sized banks. Similarly, Triwulan et al (2019) observed that firm size has strong influence on determination of profitability of manufacturing companies in Indonesia.

A number of studies have argued that size positively influences firm profitability. In a study on the effect of firm size on the profitability of Nigerian manufacturing sector;

Akinyomi & Adebayo (2013) observed that firm size measured by total assets has a positive effect on profitability. Isik and Unal (2017) established a statistically significant positive linear relationship between size measured by firm's assets among other variables and profitability of firm measured by operating return on assets. In an analysis on firm size and firm profitability, Dogan (2013) established a positive relation between size indicators and profitability of firms. Kibet and Ngaba (2018) found out that size measured by customer deposits, capital base loan book and number of branches had a significant relationship with financial performance of commercial banks in Kenya measured by ROA.

Other studies have shown a negative relationship between size and profitability. Parvin, et al (2019) observed that bank size did not have a significant influence on the profitability of the banks. Similarly, while studying the effect of bank size on profitability of commercial banks in Nepal using panel research design, Nanda & Yogesh. (2019) observed that the size of the bank measured by assets does not have a significant effect on bank profitability measured by return on assets.

While considering bank size, (Gržeta et al, 2023) showed a diverse impact of regulation on bank performance, whereby in medium to large sized banks, regulation positively affects both efficiency and profitability whereas, for small banks regulation negatively affects performance. This implied that regulation should not be implemented equally for all banks; but rather regulators should consider the size of the banks to allow for reasonable competition. These implied clustered regulations based on bank size; an aspect that has not been considered in most jurisdictions. Aladwan (2015) showing a contrary view that smaller and medium sized banks exhibited higher overall performance compared to larger banks. Based on the above arguments therefore, the

relationship between profitability and size needs to be explored further, more so how this moderated relationship between regulation of banks and profitability.

2.5.8 Age and Profitability of MFIs

Commercial Microfinance institutions are established at different times based on owner needs. This means that they will present different ages. Similarly, their growth can be measured by age based on years of establishment among other measures. Scholarly research on age and profitability presented mixed results. Oczan and Ersan (2022) studied the impact of bank age on bank financial performance using a sampled commercial bank from the Chinese banking industry using unbalanced panel data set After controlling for the bank-specific, industry-specific, and macroeconomic indicators, results demonstrate that there existed a positive and linear relationship between bank age and profitability indicators in ROA and ROE models for listed banks. Further, by use of a quadratic impact of bank age on unlisted banks' financial performance in all profitability models results showed that the influence of bank age on financial performance varies depending on whether banks are listed on the stock exchange or not.

Results indicating a negative relationship between profitability and age include Al Nawaiseh (2020) who undertook a study on effect firm's age, size and growth on its profitability based on the financial data from registered Jordanian insurance firms. Results indicated that was no significant effect of the insurance firm's age, size, and growth on its profitability. While undertaking content analysis of annual reports from Sudanese banks to analyse the effect of bank size, age, and leverage on bank

profitability. Sulub (2014) observed negative relationship between age and profitability.

In a study on firm size and profitability in Istanbul Stock Exchange firms, Dogan (2013) observed that age of the firms had a negative relation with profitability measured by return on assets. In a study on the impact of firm age on the profitability of Turkish firms using fixed effects model, Elif, (2016) observed that there is a negative and convex relationship between firm age and profitability measured by return on assets, return on equity, or gross profit margin hence suggesting that younger firms start to see a decline in their profitability from the beginning, but they may become profitable again at an old age.

2.5.9 Research Gap

The agency theory thus presents that focus on institutional context, and development of enabling relationships will provide a flexible approach to corporate governance with focus on general organisation success will enhance profitability. Theory of regulation of the other hand presents that while regulation is necessary, it is however influenced by demand and supply as well as antecedent cost implications. Hence theoretical literature generally presents the cost implications of seeking profitability. The empirical literature presents that whether regulations reduce or increase financial institutions' profitability is theoretically ambiguous (Hosonoet al, 2004). At the control of the MFIs are the institution specific factors which are several and most of them are linked to regulatory requirements. The literature therefore demonstrates that there may be a relationship between regulatory requirements and profitability, the nature and extent of which needs to be explored.

2.6 Conceptual Framework

This presents a theoretical framework that identifies the model and the correlation betw een the dependent and independent variables, facilitating the researcher's ability to disc ern the suggested relationship between the variables efficiently and expeditiously (Smy th, 2002). A conceptual framework organises and defines concepts that are important to the study, and it also explains the connections between them Creswell (2003). The stud y focuses on the financial performance as the dependent variable, whereas the independ ent factors consist of regulatory requirements, including the quality of loan portfolio, li quidity management, capital needs, and branch network. There is a hypothesis suggest ing that regulatory restrictions do not have an impact on the financial performance of M FIs.

2.6.1 Profitability of MFIs

Profitability measures the extent to which financial goals and objectives of a financial institution are accomplished. The study employed return on assets as a metric to assess profitability. This metric assesses the overall efficiency of management in creating profits using the assets at their disposal (Gitman and Zutter, 2012). The higher the firm’s ROA indicates more asset efficiency.

2.6.2 Quality of Loan Portfolio for MFIs

The quality of a loan portfolio reflects loan delinquency, projected income and the capacity to expand services to existing customers (Ledgerwood et al., 2013). PAR beyond 30 days is considered delinquent.

2.6.3 Capital Adequacy for MFIs

The Debt/Equity Ratio is a widely recognised and straightforward indicator of capital adequacy as it quantifies the institution's entire leverage (Microrate, 2014). This indicates the degree to which the money owned by shareholders can meet the commitments of creditors in case of a decline in business. A larger ratio signifies that the company is relying more on borrowing funds for its financing, hence exposing the corporation to possible risk if the levels of debt become excessively high. The more debt a firm issue, the higher are its debt repayment costs hence lower profit. (Gitman and Zutter 2012).

2.6.4 Liquidity Risk in MFIs

Liquidity risk in banks arises when depositors collectively demand to withdraw more funds than the bank currently possesses, or when borrowers default on their financial obligations to the banks (Kumar and Yadar 2013). The authors Chen et al. (2018) Banks that have a higher Funding Gap Ratio (FGR) are required to utilise their liquid assets to cover this gap, resulting in a higher exposure to liquidity risk.

2.6.5 Number of Branches for MFIs

The number of branches of MFIs influences the breadth of outreach which is one of the social objectives of the Micro-finance industry, hence more branches may imply more client base, therefore increased sales volume which leads to higher returns.

2.6.6 Control Variables

The study further considered if and how the inclusion of size as measured by assets held by a Micro-finance institution and age as measured by the number of years since establishment affects profitability of Micro-finance institutions. Size and age are not considered as regulatory requirements but might have a bearing on profitability when considered alongside the identified variables. Size of an institution gives it an advantage of economies of scale. Kibet and Ngaba (2018), found out that size measured by customer deposits, capital base loan book and number of branches had a significant relationship with financial performance of commercial banks in Kenya measured by ROA. Age of a MFIs on the other hand poses the advantage of experiential learning, which ideally ought to have a positive effect on profitability. Isayas (2021) observed a positive relationship between age and profitability.

The conceptual framework used is as shown:

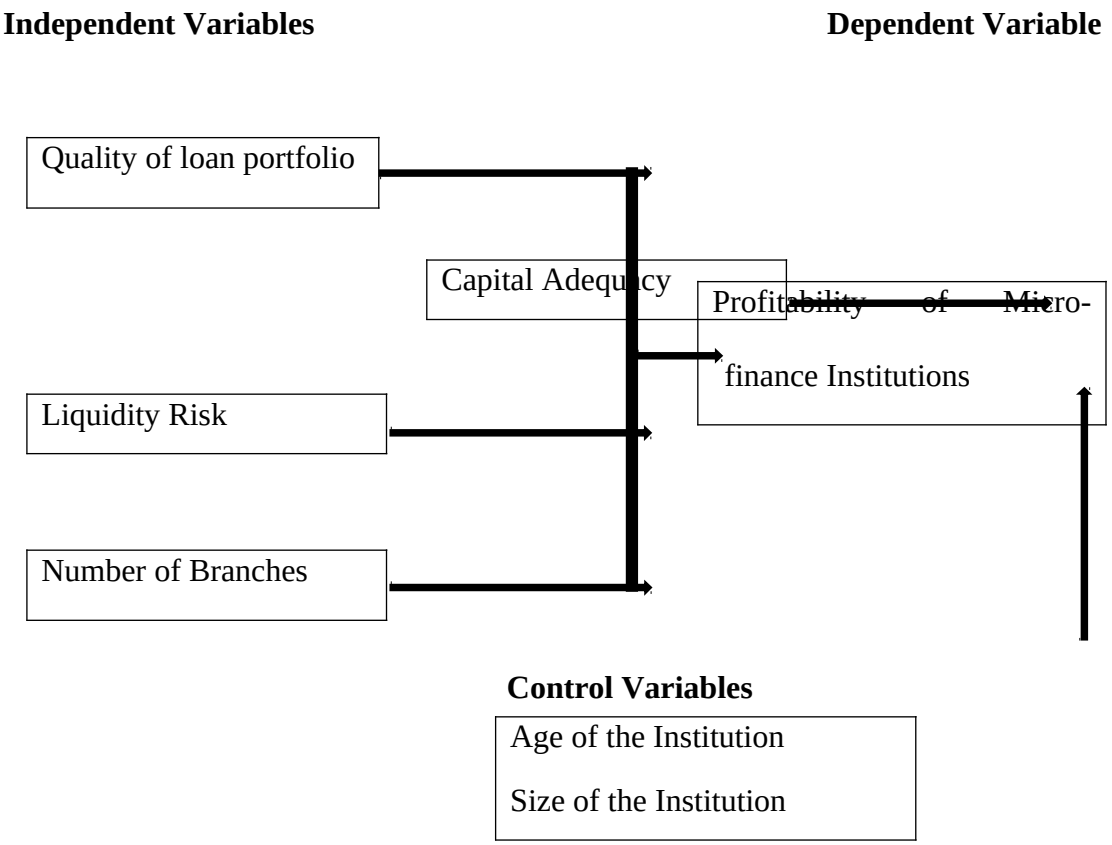

Figure 3 - Conceptual Framework

Source: Researcher (2023)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research design used in this study. Subsequently it sets out the target population, sampling techniques, sample size, research procedures, data collection methods and finally data analysis methods.

3.2 Research Design

Research designs encompass several types of inquiries within qualitative, quantitative, and mixed method methods, offering precise guidance for research procedures (Creswell ,2014). According to Schindler (2003), research design is a detailed plan that outlines how to achieve the objectives and address the research questions. The research adopted an explanatory research design. While there is often data available about the topic of study, it is possible the particular causal relationship a researcher is interested in has not been robustly studied. Explanatory studies are best suited where the area of study has not been studied in detail before and the key variables and relationships are defined, which is the case for the current study. Research that attempts to explain phenomena does so with the goals of establishing a link of causation between several factors, identifying the components' impacts, and forecasting how one phenomenon will change or vary in connection to another variable (Stydom, 2014). A causal relationship between two events exists if the occurrence of one causes the other, hence cause effect relationship.

3.3 Target Population

A population is made up of all of the items that are being considered in an investigation, regardless of the subject of study, and that contain participants in a group that a researcher is interested in learning more about. Target population is a collection members or participants with the particular qualities of interest and relevance (Creswell, 2003), and it identifies those units for which the findings (of the survey) are designed to generalise. Creswell (2003) says that target population is the group of individuals or participants with the unique qualities of interests and value (Cox 2011).

Based on the fact that the study was to assess the effect of regulations on MFI performance, the study population was considered to be the thirteen (13) MFIs licensed by CBK as of 31st December 2018, as presented in Appendix I (List of Microfinance Institutions). The choice of institutions was informed by the focus of research on regulated Microfinance institutions and the thirteen were the ones that fell within the criteria of regulated MFIs. Further all the thirteen regulated institutions were considered because this constituted the entire population of regulated MFIs while on the other hand the number was not big enough to allow selection of part of the institutions.

The study adopted inclusion or exclusion criteria to select participants in the study. Patino & Ferreira, (2018) described inclusion criteria as key features of the target population that the investigators will use to answer their research question, while exclusion criteria are features of the potential study participants who meet the inclusion criteria but present with additional characteristics that could interfere with the success of the study or increase their risk for an unfavourable outcome. The presence or

absence of complete data from the CBK for each individual MFI that was operational during the time period of the study served as the criterion for determining whether or not the MFI data should be included. This would allow the study to be complete and consistent for data analysis and in inference discussion. Appropriate criteria for inclusion and exclusion are what produce the perfect pool of individuals participating for a study, allowing for the collection of the most useful data possible (Hornberger and Rangu, (2020).

3.4 Sampling Technique

The study used census survey; a technique whereby the researcher considers the entire population for the study. Census survey was chosen because the population of study was relatively low, hence the researcher was able to target the whole population. As of 31st December 2018, only 13 MFIs were licensed by the CBK. The collected data is a non-probability sample, as the institutions selected for the study are 13, whereby the whole population is selected, and the data points are limited given the timeframe in consideration.

3.5 Measurement of Variables

The measurements that were used in the study were profitability of Micro-finance Institution measured by return on assets, quality of loan portfolio measured by portfolio at risk, capital adequacy measured by Debt-to-Equity ratio, liquidity risk measured by liquidity risk ration, and Number of branches measured by the actual number of established branches. The control variables: asset size and age of institution were measured by asset base and number of years since establishment respectively.

Table 1 - *Measurement of Variables*

Type	Variable	Measurement
Dependent Variable	Profitability of MFI	ROA
Independent Variable	Quality of Loan Portfolio	PAR> 30 days
Independent Variable	Capital Adequacy	D/E Ratio
Independent Variable	Liquidity Risk	LR Ratio
Independent Variable	Number of Branches	Actual number of branches
Control Variable	Asset Size	Asset Base
Control Variable	Age of Institution	No of years since establishment

Source: Researcher (2023)

3.6 Data Collection

3.6.1 Data Collection Instrument

According to Parahoo (1997), a research instrument is a piece of equipment that is utilised in the process of data collection. Therefore, research instruments are beneficial to researchers because of the role they play in assisting in the collection of data. For the purpose of data collection, the researcher made use of a standardised instrument. Since the data had a time series dimension, a tool was developed whereby for each variable the institutions' performance was listed against the corresponding years. This study used published data from the Central Bank of Kenya in its bank supervision annual reports for the period when the institutions were licensed.

3.6.2 Data Collection Procedures

Data was collected through desk study and obtained from the Central Bank of Kenya annual supervision reports. Secondary data was used since the variables being studied have been observed and published for several years. According to observations made by Vartanian (2010) in Martins et al. (2018), secondary data may consist of information that has been obtained in the past and is currently being considered for use in answering new questions in which the data collected was not initially intended to be used. It was pointed out by Martins et al. (2018) that making use of secondary data in research has proven to be an effective method for locating data that is appropriate for one's requirements.

Panel data was used for the study. This combined both cross-sectional and time-series data and looked at how subjects changed over time. The same cross-sectional unit is surveyed over time; hence we have data which is pooled over the institutions as well as over time. The control of individual-specific unobservable impacts that may be linked to various explicating variables is an important aim in integrating time-series and cross-section data (Hausman and Taylor; 1981). This can be accomplished by mixing the two types of data. When these unobserved individual specific effects aren't controlled for, it might contribute to bias in the estimations that are generated.

The suitability of panel data arises from the capability of studying whether changes in observed variables arise from within the institution or from between the institutions, while considering trend over time. Panels are able to provide answers to virtually any research questions, including those that would often be answered using cross-sectional data. When it comes to putting ideas to the test and developing policies,

they can additionally overcome some of the limits and potential biases that are introduced by cross-sectional data (Hans-Jürgen Andreb, 2017).

3.7 Pilot Study

Various authors have described pilot study as an exercise that ensures that errors are restricted at a very little cost. Kothari (2018) describes a pilot survey as a replica and a rehearsal of the main survey. Newing (2018) states that the importance of field pilot cannot be over emphasized; you will always find that there are questions that people fail to understand or interpret in different ways, places in the questionnaire where they are not sure where to go next, and questions that turn out simply not to elicit useful information. According to Saunders, Thornhill & Lewis (2009), pilot testing refines the questionnaire so that respondents will have no problems in answering the question. For high precision pilot studies, 1% to 10% of the sample should constitute the pilot test size (Lancaster, Dodd, & Williamson, 2010).

The pilot test was carried out immediately after the approval by the dean School of Business and Economics in April 2014. Using simple random sampling across all MFI's, data from two (2) MFI's was selected and used in the pilot study which is fifteen (15%) percent of the sampled population 13 MFI's. The subjects participating in the pilot study were not included in the final study to avoid survey fatigue.

3.7.1 Reliability of Research Instruments

According to Gay & Airason (2009), reliability is the degree to which a test consistently measures what it is measuring. An instrument is considered reliable if it produces the same or similar result each time it is administered to the same

respondents. However, Punch (2009) contends that reliability of an instrument depends on whether the questionnaire can be steadily and sincerely responded to, using scales and options given and the respondents' attitudes while responding to the instrument. It could be argued that an instrument may not be absolutely reliable even when participant's responses can be predicted each time the instrument is administered, as it may be influenced by respondent's disposition. Reliability relates to the consistency of the data collected (Wallen & Fraenkel, 2006).

The researcher used the most common internal consistency measure known as Cronbach's Alpha (α). It indicates the extent to which a set of test items can be treated as measuring a single latent variable (Cronbach, 1951). Nunnally (1978) offered a rule of thumb of 0.70 or better (but not much beyond than 0.80) which has been adopted as the threshold to test the reliability of data. This research used Cronbach's alpha to test the reliability of all the variables. The technical training institutions survey instrument was tested in its entirety, and the subscales of the instrument were tested independently, the results are summarized in Table 2.

The data collected in the pilot study was used to determine the reliability of the data collection instrument. Cronbach's Alpha with a value of between 0.7 and 0.8 was taken as being acceptable which enhances the identification of the dispensable variables which were deleted from the instruments. The tests of Cronbach's alpha for the results of the pilot study ranged from 0.756 for profitability of MFI's, 0.771 for Quality of Loan Portfolio, 0.742 for Capital Adequacy, 0.758 for Liquidity Ratio, 0.778 for Number of Branches, 0.744 for Asset Size and 0.752 for Age of Institution. This revealed a high degree of reliability. Since all the reliability results exceeded the 0.7

lower level of acceptability (Nunnally, 1978), the internal reliability of the research instruments was considered to be sufficient.

Table 2 – *Analysis of Research Instruments' Reliability*

Variable	Cronbach's Alpha	No of Items
Profitability of MFI's	.756	2
Quality of Loan Portfolio	.771	2
Capital Adequacy	.742	2
Liquidity Ratio	.758	2
Number of Branches	.778	2
Asset Size	.744	2
Age of Institution	.752	2

Source: Research Data (2023)

3.7.2 Validity of Research Instruments

An instrument is valid if it measures what it is intended to measure and accurately achieves the purpose for which it was designed (Patten, 2004; Wallen & Fraenkel, 2006). Patten (2004) emphasizes that validity is a matter of degree and discussion and should focus on how valid a test is, not whether it is valid or not. According to ibid (2004), no test instrument is perfectly valid. The researcher needs some kind of assurance that the instrument being used will result in accurate conclusions (Wallen & Fraenkel, 2006).

Validity involves the appropriateness, meaningfulness, and usefulness of inferences made by the researcher on the basis of the data collected (ibid, 2001). Validity can often be thought of as judgmental. According to Patten (2004), content validity is determined by judgments on the appropriateness of the instrument's content. Ibid (2004) identifies three principles to improve content validity: (1) use a broad sample of

content rather than a narrow one, (2) emphasize important material, and (3) write questions to measure the appropriate skill.

These three principals were addressed when writing the data collection instrument items. To provide additional validity of the survey instrument, the researcher formed a focus group of five (5) experts in the field of business finance who provided input and suggestive feedback on survey items. Members of the focus group were educators of business finance at the School of Business and Economics and master's students in the department of Accounting and Finance at Moi University, Eldoret.

Comments from the focus group indicated that the skills listed in the survey were appropriate for collecting panel data from MFI's. Some members of the focus group suggested that the study may not yield the required data and that the data could be generalized and consolidated for a more concise study. The researcher categorized application the MFI's and condensed the application component items from 15 per MFI to 10 items per MFI.

3.8 Data Analysis

Data Analysis is the processing of data to make meaningful information (Sounders, Lewis & Thornhill, 2009). Burns & Grove (2003) define data analysis as a mechanism for reducing and organizing data to produce findings that require interpretation by the researcher. According to Hyndman (2008), data processing involves translating the answers on a questionnaire into a form that can be manipulated to produce statistics. This involves coding, editing, data entry, and monitoring the whole data processing procedure.

Regression was used to perform the analysis on the data. Panel regression models were utilised in order to ascertain the relationship between the profitability of Micro-finance institutions and factors such as the quality of their loan portfolios, capital adequacy, liquidity risk, and the number of branches. A combination of analyses makes it feasible to evaluate trends in the behaviour of ratios in connection to trends in the industry as a whole. (Gitman and Zutter 2012)

The data collected provided an unbalanced panel, with some institutions' data not available for the selected years. This was because the institutions under study started operations at different dates within the time frame under consideration. If one is collecting data on a set over time, a researcher may find some data can be traced back longer than others which leads to unbalanced or incomplete data (Baltagi, 2005). We used list wise deletion to address the gap in missing data. According to Briggs et al (2003); in Marina S (2013), If any of the variables in a case have missing data, it is advisable to omit that case from the analysis. This is effective when the data is missing in a totally random manner (Nakai and Weiming, 2011). The missing data was supposed to follow a fully random pattern, where the chance of data being missing for variable 'y' is not influenced by the actual value of 'y' or any other variables in the dataset. However, it does acknowledge the potential correlation between the missing data on variable 'y' and the missing data in certain x variable (Briggs et al, 2003).

3.9 Model Assumptions, Data Validity and Reliability

Before running regression analyses, several diagnostic tests were run. Diagnostic tests are used to confirm that the model's error structure matches the standard assumptions. Diagnostic tests also evaluate the accuracy and reliability of explanatory variable

estimations. The regression assumption and panel data diagnostic tests that were run are detailed in the subsections that follow.

3.9.1 Panel Unit Root

Because the study used time series data, it was checked for stationarity. If statistical features such as mean, variance, and covariance remain constant across time and in any sample of data, time series data is termed stable (Salleset al., 2019). In all econometric investigations, (Kwiatkowski, 1992), time series must be checked for stationarity. Data that isn't stationary leads to erroneous regression (Pseudo- regression). For both tests, the null hypothesis is that the panel is stationary. First differencing is commonly used to solve the unit root problem.

3.9.2 Autocorrelation

Autocorrelation, commonly referred to as serial correlation, is an econometric issue that arises when two consecutive error components in a model are linked. The Woodridge test was employed for autocorrelation analysis. The test is optimal as it can be utilised in various scenarios and is straightforward to execute. The null hypothesis of the test states that there is no first-order autocorrelation, but the alternative hypothesis suggests the presence of autocorrelation.

3.9.3 Heteroscedasticity

Heteroscedasticity is an issue in econometrics that occurs when the error term in the mo del does not have a consistent variance (Tripodis et al., 2007). Econometric models ne cessitate that the error term have a consistent mean and variance. The presence of hete roscedasticity was assessed using the Breusch-Pagan/Cook-Weisberg test. The null hy

pothesis of this test assumes homoscedasticity. Hence, in order for the variance of the error term to be constant, the p-value of the chi2 test should be below 0.05.

3.9.4 Multicollinearity

The linear relationship between two or more predictor variables is referred to as multicollinearity. More correlation between variables might cause major problems with the model's estimates' dependability, as well as, in some cases, incorrect regression findings. The Variance Inflation Factor was used to test for multicollinearity in this investigation (VIF). A VIF number greater than 10 indicates that the data has a multicollinearity problem (Akintunde et al, 2021). Multicollinearity was also examined using the results of pairwise correlation, with a correlation coefficient larger than 0.8 being considered a sign of multicollinearity.

3.9.5 Normality

For valid hypothesis testing, regression models assume that the residual is normally distributed. The Shapiro-Wilk test for normality was used to verify this assumption. The null hypothesis of the test is that the data follows a normal distribution.

3.10 Model Specification

The study employed three models to establish the impact of the four identified variables on profitability. The first model was the pooled model (Baltagi, 1985), which sought to run the combined data regression and determine the constant coefficients, the usual assumption for cross-sectional data. In this study, the dependent variable; profitability was taken and the effects that the four variables might have on it were estimated

ignoring any specific individual effects that may arise. The model was specified as follows:

Pooled model: $yit = \alpha + x`it\beta + vit$

Where:

y_{it}= profitability of Micro-finance institution i at time t

$\mathbf{x}`_{it}$= the independent variable under investigation for institution i at time t

β = the coefficients estimated for the models

α= the intercept term for the model

v_{it}= the error term for the models

Estimation of the parameters of the pooled model enabled testing of whether there are any significant effects in the data. This was carried out by the Lagrange Multiplier Test as specified by Honda (1980), which was appropriate given the unbalanced nature of the data. The test specified the following hypotheses:

H0: There are no significant effects in the panel data.

H1: There are significant effects in the panel data.

Once it was determined that there are significant effects in the data, investigation into the nature of the effects was done. The aim was to study whether the independent variables selected explain the effects on profitability, or whether there are unobserved factors that influence the profitability of the institutions. Additionally, we specified two types of effects; individual effects and time effects for both models, which given the

sparse data, could only be carried out using the one-way effects estimation. The models (Hausman, 1981) are specified as follows:

Fixed effects model: $yit = (\alpha i + ui) + x`it\beta + vit$

Random effects model: $yit = \alpha + x`it\beta + (ui + vit)$

Where:

yit= profitability of Micro-finance institution i at time t

x`it= the independent variable under investigation for institution i at time t

β = the coefficients estimated for the models

αi= the intercept term for the fixed effects model, indicating baseline profitability per institution

α= the intercept term for the random effects models, indicating baseline profitability for all institutions

ui= fixed or random effect specific to individual (group) or time period that is not included in the regression

vit= the error term for the models

The models were used to determine whether the profitability of the institutions was correlated with the quality of loan portfolio, capital adequacy, liquidity risk and number of branches, captured by the composite intercept term $\alpha_i + u_{it}$. We also sought to determine whether profitability of the institutions is independent of the variables selected, resulting from unobserved effects that are captured by the composite error term $u_i + v_{it}$. These two models allow the capture of whether the heterogeneity between

the different institutions comes about from the variables chosen or from some unobserved factor.

In the equation, profitability, which is the dependent variable was measured by Returns on Assets. Quality of loan portfolio was measured by the PAR. A PAR beyond 30 days indicates poor quality of loan. Capital adequacy was measured by the Debt-to-Equity ratio. A higher D/E ratio implies the bank is financing its operations more from debt, hence risky. Liquidity risk was measured by the ratio of financing gap to total assets. Banks with higher FGR use their liquid assets to fund this gap, and thereby bear greater liquidity risk. Number of branches was measured by numerical number of established branches. Wider branch coverage is set up to enhance accessibility hence wider client base with potential higher returns.

To determine whether the effects are significant, two tests were carried out. The first was to compare the fixed effects model with the pooling model by using calculated F-statistic between the two models (Baltagi, 1998):

H0: There are no significant effects.

H1: There are significant effects.

The second test carried out was to determine which model is more consistent. We tested between Fixed and Random Effects Models. The test used is the Hausman Test for Panel Models (Hausman 1978), which seeks to determine whether there is inconsistency between the two models. Hausman (1978) notes that if the FE estimator (or GMM), $\theta \tilde{} FE$, is consistent whether αi is fixed or random and the commonly used RE estimator (or GLS), $\theta \tilde{} RE$, is consistent and efficient only when αi is indeed

uncorrelated with x ˜ it and is inconsistent if αi is correlated with x ˜ it. The hypotheses being tested for the two models are:

H0: The models are consistent.

H1: One of the models is inconsistent.

The model that was consistent was applied to discuss the research findings. Control variables were introduced to ensure that the observed relationships are not spurious. Two control variables will be used: Age and Size of the Micro-finance Institution. Age was measured by the number of years since establishment while size was measured by the asset base.

3.11 Ethical Considerations

According to McNamara (1994), there are five ethical problems that should be taken into account when doing survey research. The principles encompass aspects such as voluntary participation, non-harmful handling of respondents, preservation of anonymity and confidentiality, clear identification of purpose and sponsor, as well as thorough analysis and reporting. Every guideline is accompanied by detailed explanations to effectively mitigate or regulate any ethical risks.

For this study, the following ethical considerations were observed: the researcher used published data from the Central Bank of Kenya website which is available for public viewing. This ensured that only acceptable data that was already in the public domain was used in the study. The study also ensured privacy and confidentiality of individuals who took part in the development of the reports by not recording their names or designations.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

The chapter deals with data presentation, analysis, and interpretation. This is presented under the following subheadings: Introduction; demographic data; descriptive statistics, Pooled Model; Fixed effects model; Test of model preference; Random Effects model; Test between fixed effects model and random effects model; Comparison between fixed effects model and random effects model. The data is presented in the form of tables. Analysis and interpretation of data was done based on the preferred model.

4.2 Demographic Data

The data utilized in the study was from the 13 selected Micro-finance institutions from 2010 to 2018. Out of the expected 117 data points, data was available for 88 data points representing 75% of the target data. This was determined to be sufficient for analysis and discussion.

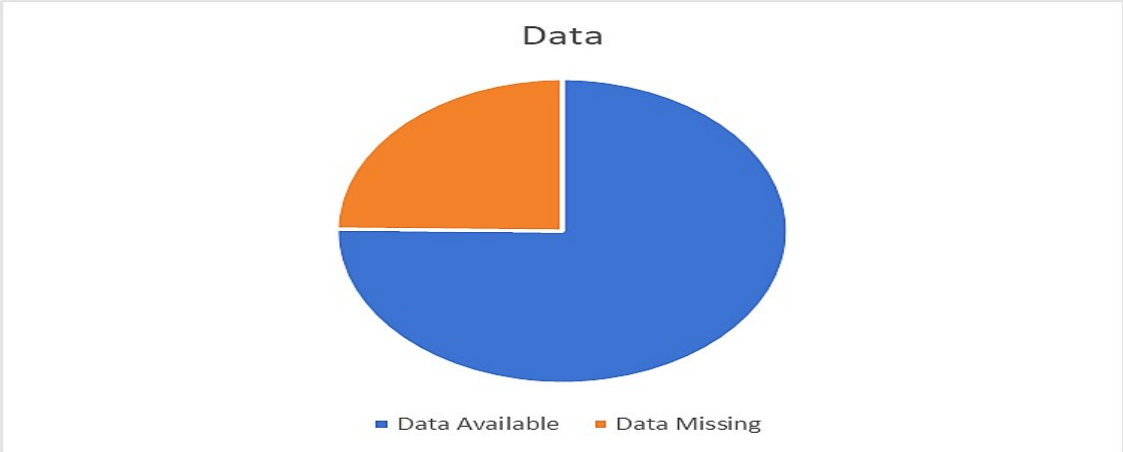

Figure 4 – Demographic Data

Source: Research Data (2023)

4.3 Descriptive Statistics

According to the findings, the mean profitability score was -0.10, and the standard deviation was 0.15. According to the data, Micro-finance institutions in Kenya have a profitability of -0.10 on average. This suggests that the institutions are not maximising their asset utilisation in order to earn profits on average. The mean score for the Quality of the Loan Portfolio was 0.34, while the standard deviation was 0.21. According to the findings, the PAR for MFIs in Kenya has a mean value of 0.34, which suggests that 0.34 percent of portfolios contain contaminated assets. The average level of adequate capital was 5.88, while the standard deviation was 9.25. The data suggest that the MFIs have, on average, a higher debt to equity ratio. This suggests that they obtain a greater portion of their funding from borrowing money, which exposes them to the possibility of danger if their debt levels are excessively high. The average value for liquidity risk was -0.06, while the standard deviation was 9.25. This suggested that MFIs are, on average, using more of their deposits to finance loans, which bears a bigger liquidity risk because the financing gap is the difference between loans and deposits. It was observed that the standard deviation for the liquidity risk was further away from the mean. The mean of the number of branches, on the other hand, was 9.23, and the standard deviation was 11.96. Based on this conclusion, it can be deduced that MFIs, on the whole, have a greater reach in terms of the number of branches they operate. The descriptive statistics of the variables utilised in the study are outlined in Table 3, which provides an overview of the data.

Table 3– *Descriptive Statistics*

Variable	n	Min	Max	Mean	Standard deviation
Capital Adequacy	13	-4.27	35.00	5.88	9.25
Liquidity Risk	13	-0.88	0.53	-0.06	0.39
QLP	13	0.07	0.72	0.34	0.21
Number of Branches	13	2	37	9.23	11.96
Age of Institution	13	2	43	13.31	13.51
Assets (Ksh “M”)	13	98.0	29582.0	5442.7	10332.7
Profitability	13	-0.43	0.03	-0.10	0.15

Source: Research Data (2023)

4.4 Pooled Effects Model

4.4.1 Pooled Effects Model without Control Variables

The pooled model uses the ordinary least squares method to determine the regression of profitability of the institution given the four independent variables. The results for the model without inclusion of the control variables indicates that the four independent variables are significant at the 5% level. The intercept has a negative impact on profitability, implying that the institutions given the variables have a base case of losses. This can be understood as the initial years of setup of the institution would require expenditure beyond their income. The model is significant at the 5% level,

explaining 66.82% of the variation of the data. The model estimation results were as given in the Table 4.

Table 4 - *Pooled Model without Control Variables*

Independent Variables	**Coefficient Estimates**	**p-value**
Intercept	-0.06320238	0.0001814
Capital Adequacy	-0.00365624	0.0191288
Liquidity Risk	0.18615428	5.451e-0
Quality of Loan Portfolio	-0.00117057	0.0001841
Number of Branches	0.00248960	0.0002929
F-Statistic	33.7346	2.0778e-15
R-squared	66.82%	

Source: Research Data (2023)

4.4.2 Pooled Effects Model with Control Variables

Next the pooled model with control variables was fitted. Inclusion of the control variables results in the model being significant with increased R-squared value which may indicate possible overfitting of the data given the lack of significance of the additional variables. The results were as given in Table 5.

Table 5 - *Pooled Effects Model with Control Variables*

Independent Variables	**Coefficient Estimates**	**p-value**
Intercept	-7.3661e-02	0.0002477
Capital Adequacy	-3.5177e-03	0.0256221

Independent Variables	Coefficient Estimates	p-value
Liquidity Risk	1.8187e-01	1.275e-06
Quality of Loan Portfolio	-1.0941e-03	0.0006622
Number of Branches	2.9414e-03	0.0843203
Age of Institution	7.5491e-04	0.2975209
Asset Base of Institution	-1.1412e-06	0.5928832
F-Statistic	22.4001	4.0766e-14
R-squared	67.40%	

Source: Research Data (2023)

4.4.3 Lagrange Multiplier Test

Having carried out the pooled model, the researcher checked whether the data has significant effects this is as shown in Table 6. This was done through the Lagrange Multiplier Test (Baltagi 1990), which tested the following hypothesis:

H_0: There are no significant effects in the panel data

H_1: There are significant effects in the panel data

Table 6 - *Lagrange Multiplier Test*

Baseline data	
Lagrange Multiplier Test (ROA ~ QLP + CA + LR + BN)	
Normal:	p-value: 0. 3303
Data with control variables	
Lagrange Multiplier Test (ROA ~ QLP + CA + LR + BN + AGE + ASSETS)	
Normal:	p-value: 0.1662

Source: Research Data (2023)

From the results shown in Table 6 the null hypothesis was rejected, indicating that there are significant effects within the data collected.

4.5 Fixed Effects Model (FEM)

4.5.1 Individual Specific Effects in FEM

The model assumed that differences between individuals can be accommodated from different intercepts, hence it is estimated to determine whether there exists difference within the institutions. Consideration is given for one-way effect analysis due to the unbalanced data used for analysis. First, we consider the individual specific effects in the data. The results of output for the model without inclusion of the control variables indicates that three of the independent variables are significant at the 5% level. The overall fit of the model is also significant, with 84.46% of the variation in the data being explained. This indicates that the individual specific effects capture majority of the variation. This is as shown in Table 7.

Table 7 - *Individual specific effects in FEM*

Independent Variables	**Coefficient Estimates**	**p-value**
Capital Adequacy	-0.00532599	6.697e-05
Liquidity Risk	0.11204121	0.031416
Quality of Loan Portfolio	-0.00094799	0.001617
Number of Branches	0.00247497	0.258950
F-Statistic	6.10445	6.5334e-05
R-squared	84.46%	

Source: Research Data (2023)

4.5.2 Time effects in FEM

Secondly the fixed effects models considers whether over time the profitability of the institution is impacted by chosen variables. The results as shown in Table 8 indicate that all variables investigated have an impact on the profitability of the institutions over time. The model is significant, while the variation that is explained stands at 58.37%.

Table 8 - *Time effects in FEM*

Independent Variables	**Coefficient Estimates**	**p-value**
Capital Adequacy	-0.00356295	0.0354825
Liquidity Risk	0.18283235	5.766e-06
Quality of Loan Portfolio	-0.00124623	0.0002034
Number of Branches	0.00246085	0.0006492
F-Statistic	27.6471	4.9742e-13
R-squared	58.37%	

Source: Research Data (2023)

4.5.3 Individual specific Effects in FEM with Control Variables

The control variables were introduced in the one-way individual effects fixed effects model. The results show that inclusion of the control variables does not change the significant variables, thought there is a change in the values of the coefficients. Despite this we confirm the efficacy of the model as the same variables are significant with the same effect on the profitability of the institution. There is an increase in the variation explained by the model, which arises from the inclusion of the control variables which

are not significant hence indicating possible overfitting of the data. Analysis of individual specific effects with the inclusion of control variables is as shown in Table 9.

Table 9 - *Individual specific Effects in FEM with Control Variables*

Independent Variables	**Coefficient Estimates**	**p-value**
Capital Adequacy	-5.3399e-03	9.89e-05
Liquidity Risk	1.1918e-01	0.033591
Quality of Loan Portfolio	-9.9623e-04	0.002495
Number of Branches	-2.9344e-04	0.937946
Asset Size	2.6797e-06	0.343240
Age of Institution	-3.5326e-04	0.927163
F-Statistic	4.60136	0.00028745
R-squared	79.00%	

Source: Research Data (2023)

4.5.4 Time effects in FEM with Control Variables

On time, one-way effects are investigated to show the trend over time for the collected data with inclusion of control variables. Results show that the significant variables remain the same with capital adequacy and quality of loan portfolio having a negative impact on profitability, liquidity risk having a positive impact on profitability. The number of branches and the control variables are not significant. The model is significant, though it explains 66.90% of the variation in the data. The results are as given in table 10.

Table 10 - *Time Effects in FEM with Control Variables*

Independent Variables	Coefficient Estimates	p-value
Capital Adequacy	-3.4369e-03	0.0439069
Liquidity Risk	1.7834e-01	1.202e-05
Quality of Loan Portfolio	-1.1662e-03	0.0006608
Number of Branches	3.0642e-03	0.0947460
Asset Size	-1.4064e-06	0.5403193
Age of Institution	8.5393e-04	0.2614193
F-Statistic	18.462	7.3208e-12
R-squared	66.90%	

Source: Research Data (2023)

4.6 Test of Model Preference

4.6.1 Pooled Model and Fixed Effects Model

Having calculated the one-way individual and time fixed effects models, the results are compared to their counterpart in the pooled model by using calculated F statistic between the two models. This will allow determination of the veracity of the effects under investigation. The test is derived from Kramer and Sonnberger (1986), comparing the two models with the following hypothesis being tested:

H_0: The pooled model is preferred.

H_1: The fixed effects model is preferred.

Table 11 - *F test for Baseline Data*

F Test for Individual Effects (ROA ~ QLP + CR + LR + BN)

F: 6.5116	p-value: 0.9504
F Test for Individual Effects (ROA ~ QLP + CR + LR + BN + AGE + ASSETS)	
F: 6.3123	p-value: 9.078e-07

Source: Research Data (2023)

The individual effects models considered in Table 10 indicate that for the model without control variables does not have significant effects while on inclusion of the control variables, the model has significant effects.

4.6.2 F Test for Data with Control Variables

The time effects were tested next, with the same test as described above. The one-way effects time models showed that there are no significant effects while the model inclusive of control variables indicates data significance. This is as shown in Table 12.

Table 12 - *F Test for Data with Control Variables*

F Test for Time Effects (ROA ~ QLP + CR + LR + BN)	
F: 0.30172	p-value: 0.9504
F Test for Time Effects (ROA ~ QLP + CR + LR + BN + AGE + ASSETS)	
F: 0.33932	p-value: 0.02794

Source: Research Data (2023)

For all models considered, we determine that there are significant effects between pooled model and fixed effects model, hence the data analysed was confirmed to be precise.

4.7 Random Effects Model (REM)

4.7.1 Individual Specific Effects in REM

The random effects model determines whether the variation in the data is as a result of unobserved factors not captured by the variables collected. Once again due to the unbalanced panel data, we consider the one-way effects. We start with individual effects model. Results show that all four variables are significant at the 5% level, though the intercept is not significant. The intercept in the random effects model indicates that baseline profitability cannot be determined under the view that there exist unobserved factors influencing profitability. Of the significant variables, capital requirements and quality of loan portfolio have a negative impact on profitability, with liquidity requirements and number of branches having a positive effect. The model explains 61.55% of the variation in the data, with 57.8% of the effects coming from unobserved effects (idiosyncratic effects) and 42.2% from individual effects. This is as shown in Table 13.

Table 13 - *Individual specific effects REM*

Independent Variables	**Coefficient Estimates**	**p-value**
Intercept	-0.02480490	0.2962721
Capital Requirements	-0.00466071	0.0001444
Liquidity Requirements	0.21803222	5.037e-07
Quality of Loan Portfolio	-0.00116628	9.425e-06
Number of Branches	0.00268019	0.0114018
Chi-Squared Statistic	91.2666	< 2.22e-16
R-squared	61.55%	

Independent Variables	Coefficient Estimates	p-value
Idiosyncratic Effects	57.8%	
Individual Effects	42.4%	

Source: Research Data (2023)

4.7.2 Time Effects in REM

Considering the one-way random time effects model, investigation is done on the trend in the data for the profitability of the institutions. Results indicate that all the variables are significant at the 5% level, similarly for the model itself given the by the Chi-Squared statistic. The time effects explained by the model though is 0%, indicating that the model is not capturing any time effects.

Table 14 - *Time Effects in REM*

Independent Variables	Coefficient Estimates	p-value
Intercept	-0.06320238	7.364e-05
Capital Requirements	-0.00365624	0.0163466
Liquidity Requirements	0.18615428	2.997e-08
Quality of Loan Portfolio	-0.00117057	7.498e-05
Number of Branches	0.00248960	0.0001326
Chi-Squared Statistic	134.939	< 2.22e-16
R-squared	64.84%	
Idiosyncratic Effects	100%	
Time Effects	0%	

Source: Research Data (2023)

4.7.3 Individual Specific Effects in REM with Control Variables

Consideration of the random effect models with inclusion of control variables occurs next starting off with the one-way individual random effects. Results indicate that capital requirements, liquidity requirements and quality of loan portfolio are significant at the 5% level. The variables have similar effects as the earlier model in terms of

coefficients and how they affect profitability. The difference occurs that the number of branches is not significant anymore. There is a decrease in the variation explained by the model, dropping to 59.04% from 61.5%. There is also a reversal in the effects, with unobserved effects explaining 47.4% and individual effects explaining 52.6% of the differences in the model. This is as shown in Table 15.

Table 15 - *Individual Specific Effects in REM with Control Variables*

Independent Variables	**Coefficient Estimates**	**p-value**
Intercept	-2.5643e-02	0.3916009
Capital Requirements	-4.9373e-03	4.787e-05
Liquidity Requirements	2.0379e-01	4.929e-06
Quality of Loan Portfolio	-1.1245e-03	5.296e-05
Number of Branches	5.0067e-04	0.8309931
Asset Size	2.1569e-06	0.3708497
Age of Institution	8.1387e-04	0.5518967
Chi-Squared Statistic	79.7736	5.4297e-14
R-squared	59.04%	
Idiosyncratic Effects	47.4%	
Individual Effects	52.6%	

Source: Research Data (2023)

4.7.4 Time Effects in REM with Control Variables

One-way time effects analysis is carried out on the trend of profitability of the institutions. Results are that capital requirements, liquidity requirements and quality of

loan portfolio variables are significant at the 5% level, with other variables not being significant. The model is significant, though time effects are not explained at all in the model. The analysis is as shown in Table 16.

Table 16 - *Time Effects in REM with Control Variables*

Independent Variables	**Coefficient Estimates**	**p-value**
Intercept	-7.3661e-02	0.0001051
Capital Requirements	-3.5177e-03	0.0223483
Liquidity Requirements	1.8187e-01	9.34e-08
Quality of Loan Portfolio	-1.0941e-03	0.0003474
Number of Branches	2.9414e-03	0.0796053
Asset Size	-1.1412e-06	0.5910485
Age of Institution	7.5491e-04	0.2936320
Chi-Squared Statistic	134.4	< 2.22e-16
R-squared	0.59041	
Idiosyncratic Effects	100%	
Time Effects	0%	

Source: Research Data (2023)

4.8 Test between Fixed Effects Model and Random Effects Model

Estimation of the two models was used to determine which of the two best explains the effects on profitability given the data. The test used is the Hausman Test for Panel Models (Hausman 1978), which seeks to determine whether the hypothesis whether there is inconsistency between the two models. The hypotheses being tested for the two models are:

H_0: The random effects model is consistent and preferred.

H_1: One of the models is inconsistent indicating fixed effects model is preferred.

4.8.1 Hausman Test for Baseline Data

For the baseline models, both individual and time effects models reject the null hypothesis, indicating the fixed effects model is a more appropriate predictor. This is as shown in Table 17.

Table 17 - *Hausman Test for Baseline Data*

Individual Effects	
Hausman Test – Individual Effects (ROA ~ QLP + CR + LR + BN)	
Chi-Squared: 6.092	p-value: 0.1924
Time effects	
Hausman Test – Time Effects (ROA ~ QLP + CR + LR + BN)	
Chi-Squared: 0.5215	p-value: 0.9714

Source: Research Data (2023)

4.8.2 Hausman Test for Data with Control Variables

For the model including the control variables, the individual effects model cannot reject the null hypothesis, indicating that the random effects model provides a more appropriate method of determining the effects between profitability and variables selected. The one-way time effects model rejects the null hypothesis, implying that the fixed effects model is better at modelling the data. This is a shown in Table 18.

Table 18 - *Hausman Test for Data with Control Variables*

Individual Effects	
Hausman Test – Individual Effects (ROA ~ QLP + CR + LR + BN + AGE + ASSETS)	
Chi-Squared: 18.737	p-value: 0.004631
Time Effects	
Hausman Test – Time Effects (ROA ~ QLP + CR + LR + BN + AGE + ASSETS)	
Chi-Squared: 0.73095	p-value: 0.9938

Source: Research Data (2023)

4.9 Comparison between Fixed Effects Model and Random Effects Model

Estimating a random effects model does not control for unobserved heterogeneity. This is because the conventional random effects model assumes no correlation between variables and the observed variables. Fixed effects model on the other hand allows for any correlation between time invariant predictors and the time varying predictors (Richard, 2018). The results under random effects in this case indicated that majority of the variations under individual specific effects were from unobserved effects. Under time effects the results did not capture any time effects hence cannot show impact of the regulations over time. Fixed effects model was thus identified to be more suitable for the data and research objective.

4.10 Summary of Hypothesis

Hypothesis testing using the results under fixed effects regression model was used for discussion of results. In summary, the hypothesis results were as given in table 19.

Table 19 - *Summary of Hypothesis*

Hypothesis	Rule	P value	Comment
Individual Specific Effects			
Ho1: QLP has no significant effect on profitability of Micro-finance institutions	Reject Ho1 if p value <0.05	p<0.002<0.05	Results reject the null hypothesis indicating that QLP has a statistically significant effect on profitability of MFIs
Ho2: Capital Adequacy has no significant effect on profitability of MFIs.	Reject Ho1 if p value <0.05	p<6.70e-05<0.05	Results reject the null hypothesis indicating that capital Adequacy has a statistically significant effect on profitability of MFIs
Ho3: Liquidity risk has no significant effect on profitability of Micro-finance Institutions.	Reject Ho1 if p value <0.05	p<0.031<0.05	Results reject the null hypothesis indicating that Liquidity Risk has a statistically significant effect on profitability of MFIs
Ho4: Number of Branches has no significant effect on profitability of MFIs	Reject Ho1 if p value <0.05	p<0.258>0.05	Results accept the null hypothesis indicating that Number of branches has no statistically significant effect on profitability of

Hypothesis	Rule	P value	Comment
Individual Specific Effects			
			MFIs
Time Effects			
Ho1: QLP has no significant effect on profitability of Micro-finance institutions	Reject Ho1 if p value <0.05	p<0.0002<0.05	Results reject the null hypothesis indicating that QLP has a statistically significant effect on profitability of MFIs
Ho2: Capital Adequacy has no significant effect on profitability of MFIs.	Reject Ho1 if p value <0.05	p<0.035<0.05	Results reject the null hypothesis indicating that QLP has a statistically significant effect on profitability of MFIs
Ho3: Liquidity risk has no significant effect on profitability	Reject Ho1 if p value <0.05	p<5.77e-06<0.05	Results reject the null hypothesis indicating that QLP has a statistically significant effect on profitability of MFIs
Ho4: Number of Branches has no significant effect on profitability of MFIs	Reject Ho1 if p value <0.05	p<0.001<0.05	Results reject the null hypothesis indicating that Number of branches has a statistically significant effect on profitability of MFIs

Source: Researcher (2023)

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a discussion of findings, summary of key findings and suggestion for further research. This chapter also includes the conclusion and recommendation made from the findings in the research work. The aim of the study was to look at how the four factors identified impacted the profitability of the institutions selected for the study. Capital requirements, liquidity management, quality of loan portfolio and number of branches were the factors considered, while profitability was the dependent variable whose impact upon was being measured. The study utilized panel data to determine the effects.

5.2 Summary of Findings

The research findings were based on results of regression analysis using the data collected. The results indicate that bank profitability is impacted by both individual specific and time factors considering the variables used. These were as discussed below:

5.2.1 Effect of Quality of Loan Portfolio on Profitability of Micro-finance Institutions

PAR of over thirty days was used to measure the quality of loan portfolio. This was arrived at as follows: PAR> 30 days = NPL/Advances. A higher value under QLP

implies that there are more NPL compared to advances leading to a worse off loan book.

Results reject the null hypothesis indicating that QLP has a statistically significant effect on profitability of MFIs with a P value of 0.002 and 0.0002 for individual specific and time effects respectively. The relationship is negative for both individual specific and time effects. The results reveal that on individual specific factors, for every unit increase in quality of loan portfolio there is a decrease in profitability of MFIs by 0.001 (0.1%) other factors held constant. While considering time variations, the results indicate that over time for every unit increase in QLP there is a decrease in profitability of MFIs by 0.001. (0.1%). The level of variation in profitability given the capital adequacy measure is low indicating a weak relationship between the two variables.

The negative relationship with profitability implies that the worse off the loan book is, the worse off profitability will be: The results are consistent with Salike (2017) who observed that poor asset quality is significantly and negatively associated with banks' financial performance, implying that any increase in poor asset quality will indicate a lower return for the bank because more loans are likely to be provisioned or directly written-off if this ratio gets bigger. The information asymmetry comes to play in this scenario whereby the bank managers may not be aware of all information about the borrower, which may lead to defaults hence poor QLP.

5.2.2 Effect of Capital Adequacy on Profitability of MFIs.

Debt/equity ratio was applied to measure capital adequacy of MFIs. The ratio applied was total debt as represented by total liabilities to Equity. This shows the capital strength of MFIs by comparing liabilities with the total equity and reflects the value of

assets financed by either owner equity or debt funds. Higher the D/E ratio means more funds have to be guaranteed by own capital.

The null hypothesis is rejected indicating that capital adequacy influences profitability of MFIs. The results show a negative effect both under individual specific and time effects. On individual specific effects, results indicate that for every increase in capital adequacy by one unit measured by the debt/equity ratio there is a 0.005 (0. 5%) decrease in profitability. Over time, every unit increase in capital adequacy leads to a decrease in profitability by 0.004 (0.4%) as reflected under time effects However, the level of variation in profitability given the capital adequacy measure is low indicating a weak relationship between the two variables.

The results are consistent with Mugun et al., (2019) who observed that D/E ratio had a negative relationship with return on assets with a correlation coefficient of -0.0026. (0.26%). The negative relationship between the capital adequacy measure and profitability shows that more debt was used to finance the institution leading to low profitability which is consistent with Nwude and Antalechi (2018) and Habimana (2018) who argued that there is an optimal level of debt-to-equity ratio, above which the marginal benefit of financing capital with debt starts decreasing. This are however contrary to the risk return trade off which assumes more debt financing hence high leverage leads to higher return. Kebewar (2012) on the other hand noted that according to the agency costs theory, there are two contradictory effects of debt on profitability, firstly it is positive in the case of agency costs of equity between shareholders and managers, secondly, its effect is negative, resulting from the agency costs of debt between shareholders and lenders.

5.2.3 Effect of Liquidity Risk on Profitability of Micro-finance Institutions.

The ratio of advances less customer deposits to assets was used to measure liquidity risk. Under the risk return trade off; low levels of uncertainty are associated with low potential returns while high levels of risk are associated with high potential returns.

The null hypothesis is rejected, indicating that liquidity risk influences profitability of MFIs. Under individual specific effects, results show that for every increase in liquidity risk by one unit, profitability of MFIs increases by 0.11 (11%) while over time for every increase in liquidity risk by one unit, profitability increases by 0.18. (18%) Liquidity risk registered the highest effect on profitability compared to the other variables under consideration.

Liquidity risk has a positive impact on the profitability of the institution which follows from the fact that the better the institution manages its liquidity risk, the better they are at turning investments into profits. This follows from the risk-return trade off that states that the potential return rises with an increase in risk. This was also observed by Arif and Anees (2012) in a study on the impact of liquidity risk on profitability in Pakistan Banks. The results were that liquidity risk affects bank profitability significantly. This was also observed by Ariffin and Kassim (2014) that banks with the highest liquidity risk expected and obtained the highest return on their equity.

5.2.4 Effect of Number of Branches on profitability of MFIs

The number of branches were measured by the actual numerical number of established branches. Under individual specific effects, Number of branches had a P value of 0.25 hence not significant. The null hypothesis is thus accepted indicating bank branches

have no effect on bank profitability. This shows that while considering individual specific effects, bank profitability is not significantly affected by the number of branches, a possible indication that profitability is not determined by the institution's physical customer as an outreach channel. This can be attributed to the fact that branches are meant to increase outreach which can as well be attained by use of alternative channels of branchless banking like use of ATMs, mobile banking, and agency banking. This was also observed by Prior and Mora (2019) in a study on how implementing branchless banking partnerships can enable MFIs to improve their efficiency and to expand products.

On the other hand, under time effects the null hypothesis is rejected indicating that there is a relationship between number of branches and profitability of MFIs. Results show that for every increase in number of branches by one unit profitability of MFIs increases by 0.002 (0.2%) implying that over time diversification into the branch banking will increase profitability. This can be attributed to the fact that in most cases, the bank has already established itself and attained a number of branches whose returns in investment can be realised later in the MFIs life., The results are consistent with Sydney (2019) who observed that branching restrictions in the USA during the early 20^{th} century inhibited diversification and lowered profitability relative to their counterparts in Canada. Olsen (2017) also observed that though Kenya's conformance level in digital banking is high, other aspects of customer journey cannot adequately be handled by digital means alone, hence the need for branching.

The inclusion of the control variables does not change the significant variables. Capital adequacy, quality of loan portfolio and liquidity risk remain significant with the similar effects. Number of branches however changes whereby the introduction of control

variables changes to significant under individual specific effects. This implies that size as measured by asset base and age as measured by the number of years influence the relationship between number of branches and profitability of MFIs. This further collaborates the observation of increased profitability due to branching under time effects. The control variables on their own are observed to be not significant in explaining the relationship with profitability, implying size and age of MFIs do not affect profitability on their ownThe effect of individual specific factors on profitability is consistent with Menicucci and Paolucci (2016) who established that bank specific characteristics have statistically significant impacts on European banks' profitability. Based on the findings above, we can argue that over time the performance of MFIs is impacted by regulatory requirements which is consistent with Ashta and Fall (2012) in Abraham (2017) who examined why Micro-finance institutions develop in some countries more than others and observed that while the success of Micro-finance is linked to the economic performance of the various jurisdictions, regulatory and public governance also matters.

5.3 Conclusion

From the panel regression carried out and based on the Lagrange multiplier test, the study established that there are significant effects in the data collected. The study further sought to determine the most consistent model to use between the fixed effects and random effects models. The random effects showed that while all models were significant, the time effects were not present given that all variation was idiosyncratic. By use of Hausman test for panel data, it was determined that the fixed effects model to be more suitable. The fixed effects model was fitted to the data, first with the initial selected variables, then with control variables included. Both models for individual and

time effects were significant and explained a large proportion of the variation within the data. The inclusion of the control variables also indicated that the fixed effects models were still significant for both individual effects and time effects.

For both individual and time effects, Capital Adequacy, Liquidity Risk and Quality of Loan Portfolio were significant variables. Capital adequacy had a negative impact of profitability with a beta value of 0.005 and 0.004 under individual specific and time effects respectively and rejected the null hypothesis that capital adequacy has no effect of profitability of MFIs. This implies that a higher debt to equity ratio resulted in lower profitability. Quality of loan portfolio had a negative impact on profitability with beta values of 0.001 and 0.001 under individual specific and time effects respectively implying increase in PAR led to decrease on profitability. This too rejected the null hypothesis. Liquidity risk on the other hand had a positive impact on profitability with beta values of 0.11 and 0.18 under individual specific and time effects respectively which implied that a higher financing gap ratio resulted in higher profitability. Liquidity risk too rejected the null hypothesis and showed the highest variability with profitability. Number of branches was insignificant under individual specific effects hence it does not affect the profitability of the institutions; but significant under time effects explaining a variability of 0.002.

The data indicates that there are strong individual and time effects for the fixed effects model. As a result, the three variables under review capital adequacy, quality of loan portfolio and liquidity risk have significant impact on the profitability of the institutions, with liquidity risk having the highest variability. On an individual basis, each institution has its own firm specific differences, while there is also a trend over

time for profitability to increase. It can be concluded that regulatory requirements impact profitability.

5.4 Recommendation

It is recommended that: MFI should work towards maintaining a healthy loan book through establishing and enforcing loan policies to enhance profitability; MFI should strike a balance in debt financing given that that there is an optimal level of debt-to-equity ratio, above which the marginal benefit of financing capital with debt starts decreasing; MFIs should adopt and/or strengthen liquidity risk management practices in order to tap into the benefits of increased profitability arising from investing in risky ventures.

Policy makers should extend the regulation of Micro-finance institutions to the credit only MFIs as well as other non-regulated institutions for them to benefit from the regulatory requirements as well enhance market discipline, given that over time profitability is impacted from regulation. At the same time Micro-finance players including practitioners should embrace continual review of the Micro-finance environment in order to make best returns out of investment decisions, particularly embrace the use of alternative channels of outreach given that branching has no significant effect on profitability.

5.5 Areas for Further Research

The study proposes that further study be carried out with the inclusion of the non-regulated Micro-finance institutions who represent a large market share of the Micro-finance industry. A Given the high variability of liquidity risk on profitability, it is

recommended that more studies be undertaken to cover other aspects of risk management on profitability of Micro-finance institutions. More theory should be fronted on non-regulated Micro-finance institutions with the aim of encouraging self-regulation and/or peer regulation and how best this should be achieved by the industry players. Additionally, alternative variables and variable measurement can be adopted to give further information on regulation effects beyond those used in this study.

The study focused on only four variables while in the business environment there are other factors that could affect profitability of Micro-finance institutions. The study therefore recommends further studies incorporating the variables not covered by the study.

REFERENCES

Abdelaziz, H., Rim, B., and Helmi H (2020). The Interactional Relationships between Credit Risk, Liquidity Risk and Bank Profitability in MENA Region; Global business review; Available at https://doi.org/10.1177/0972150919879304.

Acosta, F. R. and Ndonga, S. (2014). "Musoni Micro-finance Kenya: IT-enabled business model", Emerald Emerging Markets Case Studies, 4(1). Available at https://doi.org/10.1108/EEMCS-07-2013-0136.

Admati, A. DeMarzo, P. Hellwig, M. and Pfleiderer, P. (2013). Fallacies, irrelevant facts, and myths in the discussion of capital regulation: why bank equity is not socially expensive; Available at http://papers.ssrn.com/sol/papers.cfm.

Agasha E, Monametsi G amd Feela T (2020) Loan portfolio quality of Micro Finance Institutions in Uganda; A Qualitative Analysis

Ahmad, R., and Albaity, M. (2019). Determinants of Bank Capital for East Asian Countries; Global Business Review, 2(6), pp. 1311-1323. Available at: https://doi.org/10.1177/0972150919848915.

Ajang J. et al, (2018). Effect of loan portfolio management on the profitability of deposit taking Micro-finance institutions in Nairobi, Kenya; International Journal of Economics, Commerce and Management United Kingdom. 4(2), pp. 283. http://ijecm.co.uk/ ISSN 2348 0386.

Akani, H. W., and Akani, V. (2018). Theoritical Perspectives of Earnings, Profitability and Asset Quality in Banking; A Descriptive Evidence From Nigeria Economy, World Journal of Finance and Investment Research 3(1). ISSN 2552-7125.

Akenga, G. (2017). Effect of Liquidity on Financial Performance of Firms Listed at the Nairobi Securities Exchange, Kenya", International Journal of Science and Research, 6(7), pp. 279-285. ISSN (Online): 2319-7064 https://www.ijsr.net/search_index_results_paperid.php?id=ART20175036.

Akintunde, M. O., Olawale, A. O., Amusan, A. S., and Azeez, A. I. A. (2021). Comparing Two Classical Methods of Detecting Multicollinearity in Financial and Economic Time Series Data. Theoretical Physics, 7(3), 62-67.

Aladwan M (2015) The Impact of Bank Size on Profitability; An Empirical Study on Listed Jordanian Commercial Banks; 'European Scientific Institute, International Institute for Science, Technology and Education (IISTE): E-Journals

Aladwan S M (2015) The Impact of Bank Size on Profitability; An Empirical Study on Listed Jordanian Commercial Banks. European Scientific Journal December 2015 edition vol.11, No.34 ISSN: 1857 – 7881 (Print) e - ISSN 1857- 7431.

Alfredo, M. (2019). Financial exclusion and branch closures in Spain after the Great Recession; Regional Studies, 53(4) pp. 562-573. DOI: 10.1080/00343404.2018.1462485

Ali, A. E. E. S. (2015). The regulatory and supervision framework of Micro-finance in Kenya. Int'l J. Soc. Sci. Stud., 3, 123.

Ali, G. R., and Okibo, B.W. (2015). Effects of Central Bank of Kenya Prudential Regulations on Financial Performance of Commercial Banks operating in Kisii County; International Journal of Social Sciences Management and Entrepreneurship 2(1) pp.262-273, Sage Global Publishers.

Ali, S. (2015). The regulatory and supervisory framework of Micro-finance in Kenya. International Journal of Social Science Studies 3(5). ISSN 2324-8033 E-ISSN 2324-8041 URL: http://ijsss.redfame.com

Almazari, A. A. (2011). Financial Performance Evaluation of Some Selected Jordanian by using the DuPont System of Financial Analysis Commercial Banks. International Research Journal of Finance and Economics. 68, 50-63 2887. E-ISSN 1916-9728 doi:10.5539/ijef.v4n4p86 http://dx.doi.org/10.5539/ijef.v4n4p86

Amahalu, N., Okoye, E., Nweze, L., Obi, C., and Okika, E. C. M. (2017). Effect of capital adequacy on financial performance of quoted deposit money banks in Nigeria. The 2017 international conference on African entrepreneurship and innovation for sustainable development, 841 chapter 57 841-862.

Aranson, P. (1990). “Theories of Economic Regulation: From Clarity to Confusion.” Journal of Law and Politics. 6 pp 247–286.

Ariffin, N. M., and Kassim, S. H. (2014). Liquidity Risk Management and Financial Performance; Islamic Banking and Financial crisis, Reputation, Stability and Risks; UPSO, ISBN-13: 9780748647613; Edinburgh Scholarship Online:DOI: 10.3366/edinburgh/9780748647613.001.0001

Atieno, A., Anyango, and Rotich, W. G. (2016). Role of strategic planning on the performance of Micro-finance institutions in Kenya: a case of Micro-finance institutions in Nairobi. Strategic journal of Business and change management 3 pp. 154-178. Online ISBN: 9781119198918; DOI: 10.1002/9781119198918

Aymen, B. M. (2013). Impact of capital on financial performance of banks: The case of Tunisia. Banks and Bank Systems, 8(4), 47-54. Banking regulatory theories

Baltagi, B. H. (1985). Pooling cross-sections with unequal time-series lengths. Economics Letters, 18(2–3) pp. 133-136

Baltagi, B., Chang, Y., and Li, Q. (1998). “Testing for random individual and time effects using unbalanced panel data.” Advances in econometrics, 13, 1-20.

Barth, J., Caprio, G. and Levine, R. (2004). Regulation and supervision: what works best? Journal of Financial Intermediation, Vol. 13 No. 2, pp. 205-248.

Beck, T. (2015). A critical literature survey, IEG working paper 2015/4, world Bank Group.

Beckmann, R. (2007). Profitability of Western European banking systems: Panel Evidence on structural and cyclical determinants. Series 2: Banking and Financial Studies. No. 17, 2007.

BIS (2001). Sound practices for the management and supervision of operational risks, Basel committee on bank supervision

BIS (2009). International framework for liquidity risk measurement, standards and monitoring, Basel Committee on Banking Supervision.

BIS (2009). Regulatory reforms: remaining challenges; Basel committee on bank supervision. http://www.bis.org/speeches/sp110711.htm

Bitok, J. (2011). The Determinants of Leverage at the Nairobi Stock Exchange, Kenya. The Asian Business and Management conference official conference proceedings, 1-21.

Bonfim, D., and Kim, M. (2012). “Liquidity risk in banking: is there herding?” European Banking Center Discussion Paper, 24, pp.1-31. Retrieved from https://www.bportugal.pt

Bougatef, K. (2017). Determinants of bank profitability in Tunisia: does corruption matter? Journal of Money Laundering Control, 20(1), pp. 70-78. DOI 10.1108/JMLC-10-2015-0044

Briggs, A., Clark, T., Wolstenholme, J., and Clarke, P., (2003). Missing.... presumed at random: cost-analysis of incomplete data. Health Economics 12, pp. 377–392.

Brix, L., and MCKee, K. (2010). Consumer Protection in Low Access Environment; Opportunities to Promote Responsible Finance, CGAP Focus notes no. 60

Bruno, B., Onali, E., and Schaeck, K. (2018). Market Reaction to Bank Liquidity Regulation. Journal of Financial and Quantitative Analysis, 53(2), pp. 899-935. Doi: 10.1017/S0022109017001089

Burns, N. and Grove, S. (2003). *The Practice of Nursing Research: Conduct, Critique and Utilization.* Philadelphia: W. Saunders

Chance, C. (2011). Key issues in Micro-finance legislation and regulation. Retrieved from https://onlineservices.cliffordchance.com.

Changwony, M. K. and Rotich, D. G., (2015). Role of Internal Audit Function in Promoting Effective Corporate Governance of Commercial Banks in Kenya. International Journal of Business and Law Research, 3(1), pp. 15-33.

Chaudary, S., and Salvador-Adebayo, D. (2014). Why Regulate Financial Markets? The Underlying Rationale for Financial Regulation in the Wake of the Current Crisis Available at SSRN: https://ssrn.com/abstract=2450966

Chen, Y. K., Shen, C. H., Kao, L. and Yeh, C. Y. (2018). “Bank liquidity risk and performance”, Review of Pacific Basin Financial Markets and Policies, 21(1), pp. 1-40

Chepchirchir, M. and Otuya, R. (2017), Effects of the portfolio management strategies on profitability of Micro-finance institutions in Kenya, a case study of Faulu Kenya, Nakuru County, International Journal of Humanities and Social Studies, 5(1).

Christen, R. P., and Rosenberg, R. (2000). The rush to regulate: Legal frameworks for Micro-finance (Occasional Paper No. 4). Washington, DC: CGAP.

Cox, G. B. (2008). Target population, chapter in: Encyclopedia of survey research methods DOI: https://dx.doi.org/10.4135/9781412963947.n571

Creswell, J. W. (2003). Research design: Quantitative, qualitative and mixed methods approaches (2nd ed.).

Creswell, J. W. (2013). Research design: Qualitative, Quantitative, and Mixed Methods Approaches. Sage publications

Creswell, J. W., and Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approaches.

Cull, R., Demirguc-Kunt, A., and Morduch, J. (2009). Does Regulatory Supervision Curtail Micro-finance Profitability and Outreach?

Cull, R., Demirgüç-Kunt, A., and Morduch, J. (2014). Micro-finance meets the market. Journal of Economic perspectives, 23(1), pp. 167-192.

David, J. (2018). Effect of Central Bank of Kenya Regulations on the Financial Performance of Micro-finance Banks; Strategic Journal of Business and Change Management. Corpus ID169447131

Dawson, C. (2009). Introduction to research methods: A practical guide for anyone undertaking a research project. Hachette UK.

De Nicolò, G. (2016). Liquidity Regulation: Rationales, Benefits and Costs; National Institute Economic Review, 235 (1) pp. R18-R26., First Published February 2, 2016. https://doi.org/10.1177/002795011623500112.

Deb, J. (2018). Competition and Commercialization of Micro-finance Institutions for the Sector; International Journal of Business Ethics in Developing Economies 7(2) pp. 27-36https://publishing India.com/isbed.

Demirguc-Kunt, A., and Huizinga, H. (1999). “Determinants of commercial bank interest margins and profitability”. World Bank Economic Review 13, pp. 379-408. DOI 10.1108/IMF-05-2016-0160.

Den Hertog, J. (2000). “General Theories of Regulation.” In B. Bouckaertand G. de Geest (eds.), Encyclopedia of Law and Economics: Volume III. The Regulation of Contracts, Cheltenham, UK, Edward Elgar. doi:10.5539/ijef.v9n6p98.

Dewartripoint and Tirole (1994). The Prudential Regulation of Banks, Cambridge MA: MIT Press.

Dictionary of Economics. Available at: www.dictionary of economics.com; Licensee: Palgrave Macmillan.

Diego, A., Luciano, B., Gilnel, L., and Emidio, G. (2017). Why Micro-finance institutions exist: lending groups as a mechanism to enhance informational symmetry and enforcement activities; OandS - Salvador, v. 24, n. 83, p. 633-654, Out./Dez. 2017 634 Online version ISSN 1984-9230 available at www.revistaoes.ufba.br https://doi.org/10.1590/1984-9240835.

Doğan M (2013) Does Firm Size Affect the Firm Profitability? Evidence from Turkey Research Journal of Finance and Accounting ISSN: 2222-1697 (Paper) ISSN 2222-2847 (Online) Vol.4, No.4.

Ekanem, I. (2010). Liquidity Management in small firms: A learning perspective. Journal of Small Business and Enterprise Development, 17 (1), pp. 123-138 q Emerald Group Publishing Limited 1462-6004 DOI 10.1108/14626001011019161.

Elif A (2016) Does Firm Age Affect Profitability? Evidence From Turkey; International Journal of Economic Sciences; Vol. V, No. 3.

Farrington, T. and Abrams, J. (2002). The Evolving Capital Structure of Micro-finance Institutions." Micro-Enterprise Development Review, Washington D.C. Inter-American Development Bank Working Paper.

Fatima N (2014) Capital Adequacy; A financial Soundness Indicator for Banks. Global Journal of Finance and Management vol 6 no 8 pp 771-776

Faye, A. (2016). Re: What is the relationship between R-squared and p-value in a regression? Retrieved from https://www.researchgate.net/post/What_is_the_relationship_between_R-squared_and_p-value_in_a_regression/57612faddc332d362552c5f1.

Freixas, X., and Rochet, J. (1997). Microeconomics of Banking, MIT Press, Cambridge, Massachusetts. Future of Capitalism. New York (NY): Public Affairs.

FSD Kenya. (2012). Results of A Study of Post-Project Replication of Groups in COSALO. Nairobi: FSD Kenya / FSD Updates.

Galletta, S. and Mazzu, S. (2019). Liquidity risk drivers and bank business models; Risks 2019, 7, 89; doi: 10.3390/risks7030089 available at www.mdpi.com/journal/risks

Gamage, C., Lock, K. L. and Fernando, A. (2014). A Proposed Research Framework: Effectiveness of Internal Control System in State Commercial Banks in Sri Lanka. International Journal of Scientific Research and Innovative Technology, pp. 25-44.

Gatev, E., Schuermann, T., and Strahan, P. (2009). Managing Bank Liquidity Risk: How Deposit-Loan Synergies Vary with Market Conditions. The Review of Financial Studies, 22(3), pp. 995-1020.

Gaudens-Omer, K. T. (2018). Regulation in a Mission Drift Context; Journal of Economics and Development Studies, 6(1), pp. 53-62. ISSN 2334-2390 (Online) DOI: 10.15640/jeds.v6n1a6 URL: https://doi.org/10.15640/jeds.v6n1a6

Gay, L., & Airason, P. (2009). *Educational Research: Competencies for Analysis and*

Georgeta, V., and Elena, A. N. (2016), "Liquidity and Profitability Analysis on the Romanian Listed Companies", Journal of Eastern Europe Research in Business and Economics, Article ID 161707, DOI: 10.5171/2016. 161707.

Gilje, E. P., Loutskina, E., and Strahan, P. E. (2016). Exporting Liquidity: Branch Banking and Financial Integration; The journal of finance, 71(3), pp. 1159-1184 https://doi.org/10.1111/jofi.12387.

Githae J, Muriuki M and NJERU E (2018) Influence of Electronic Banking on Financial Performance of Deposit Taking Micro-finance Institutions in Kenya; Strategic Journal of business and change management; Vol 5, No 3

Glen, S. (2021). "Hausman Test for Endogeneity (Hausman Specification Test)" From StatisticsHowTo.com: Elementary Statistics for the rest of us! Available at: https://www.statisticshowto.com/hausman-test/.

Gloria, C., Luis, R., and Robert, W. (2012). Has Agency Theory Run Its Course? Making Theory More Flexible to Inform the Management of Reward System. Corporate Governance, An International Review, 20 (6) pp. 526-546. Available at:https://DOI.ORG/10.1111/ORG.12004.

Gropp, R., and Heider, F. (2009). The determinants of Capital Structure. European Central Bank, Working Paper Series, No. 1096, September, 2009.

Haiyambo, E. (2016). An impact assessment of the regulation of Micro-finance institutions in Namibia (Doctoral dissertation, Stellenbosch: Stellenbosch University).

Hakimi, A., and Zaghdoudi, K. (2017). Liquidity Risk and Bank Performance: An Empirical Test for Tunisian Banks; Business and Economic Research, 7(1). ISSN 2162-4860, https://doi.org/10.5296/ber.v7i1.10524.

Hans-Jürgen, A. (2017). The need for and use of panel data. IZA World of Labor 2017: 352 doi: 10.15185/izawol.352 | wol.iza.org.

Haq, M., Hoque, M., and Pathan, S. (2008). Regulation of Micro-finance institutions in Asia: A comparative analysis. International review of business research papers, 4(4) pp. 421-450.

Harelima J and Uwibambe R M; (2018) Effects of Central Bank of Rwanda Regulations on the Financial Performance of Commercial Banks in Rwanda; Business and Economics Journal Review Article Business and Economics Journal Volume 13:04, 2022 ISSN: 2151-6219

Hartarska, V., and Nadolnyakb, D. (2007). Do regulated Micro-finance institutions achieve better sustainability and outreach? Cross-country evidence Applied Economics, 39,

pp.1207–1222 Applied Economics print/ISSN 1466–4283 online _ 2007 http://www.tandf.co.uk/journals DOI: 10.1080/00036840500461840.

Haubrich, G. J. (2001). Risk Management and Financial Crisis; http://econpapers.hhs.se/article

Hausman, J. (1978). “Specification Tests in Econometrics.” Econometrica, 46, 1251–1271.

Hausman, J. and Taylor, W. (1981). “Panel Data and Unobservable Individual Effects.” Econometrica, 49, 1377–1398.

Hausman, J., and Taylor, W. (1981). Panel Data and Unobservable Individual Effects. Econometrica, 49(6), 1377-1398. doi:10.2307/1911406.

Hess, K and Francis, G. (2004). “Cost income ratio benchmarking in banking: a case study”, Benchmarking: An International Journal, 11(3) pp.303-319.

Hlebik, S., and Ghollani, L. (2017). Management strategies for Banks’ liquidity risk,

Honda, Y. (1985). “Testing the Error Components Model with Non–Normal Disturbances.” Review of Economic Studies, 52 pp.681–690.

Hosono, K., Iwaki, H. and Tsuru, K. (2004). “Bank regulation and market discipline around the world”, Research Institute of Economy, Trade and Industry (RIETI) Discussion Paper Series 04-E-031.

Hyndman, D. (2008). *Introduction. Analog and Hybrid Computing, 1-14.*

IMF (2009). Micro-finance: Access to sustainable funds. Retrieved from: http://www.emeraldinsight.com.

Isayas Y (2022) Determinants of banks’ profitability: Empirical evidence from banks in Ethiopia, Cogent Economics and Finance, 10:1, 2031433, DOI: 10.1080/23322039.2022.2031433

Isik, O., Unal, E.A.,Unal Y., (2017). The effect of firm size on profitability: evidence from Turkish manufacturing sector. Journal of Business, Economics and Finance (JBEF), V.6, Iss.4, p.301-308.

Jaggia, S and Thosar, S (2017). Pay-for-performance incentives in the finance sector and the financial crisis; International Journal of Economics and Finance; 9(6).

Jensen, M., and Meckling, W.H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics, 3(4), pp.305-360.

John, Akinyomi & Adebayo, Olagunju A (2013). Effect of firm size on profitability: Evidence from Nigerian manufacturing sector. Prime Journals of Business Administration and Management. 3. 1171-1175.

Joskow P L, Noll R, Niskanen W, and Bailey E. E. (1994). Economic Regulation; Chapter in American Economic Policy in the 1980s; (pp. 367 - 452) Conference of October 1990. Available at http://www.nber.org/chapters/c7757.

Joskow, P.and Noll, R. (1981). “Regulation in Theory and Practice: An Overview.” In G. Fromm (ed.), Studies in Public Regulation, MIT Press Series on the Regulation of Economic Activity, Cambridge, MA the MIT Press.

Joskow, P. L., Noll, R., Niskanen, W., Bailey, E. (1994). Economic regulation; Chapter in NBER book “American Economic Policy in the 1980s (1994),” Martin Feldstein, (Eds.). pp. 367-452. Available at https://www.nber.org/chapters/c7757

Kaburi, S. N., Ombasa, B. B., Omato, D. N., Mobegi, V. O., andMemba, F. (2013). An overview of the role of Micro-finance in eradicating poverty in Kenya; A lesson to

be learnt from the emerging economies. International journal of arts and commerce, 2(5), 34-39.

Kamau, J. W, (2008). Determinants of profitability of Micro-finance institutions in Kenya. (Unpublished Thesis), University of Nairobi repository.

Kanga, O. S., and Achoki, G. (2016). Liquidity and Financial Performance in Agricultural Firms listed in the Nairobi Securities Exchange in Kenya; International journal of business and social science, 7(7).

Kar, A. K. (2012). Does capital and financing structure have any relevance to the performance of Micro-finance institutions? International Review of Applied Economics, 26(3), pp.329-348.

Kar, A. K., and Swain, R. B. (2014). Competition, performance and portfolio quality in Micro-finance markets, Working Paper, available at: http://hdl.handle.net/10419/123797.

Kashyap, K. Rajan, R. and Stein, C. (2002). Banks as liquidity providers: an explanation for the coexistence of lending and deposit taking. The Journal of Finance, 57(1), pp.33 73.

Kathomi, A., Maina, E., and Kariuki, S. (2017). Interest rate regulations and sustainability of Micro-finance institutions in Nairobi County. International Academic Journal of Human Resource and Business administration, 2(3), pp150-156.

Kebewar, M, (2012) The Effect of Debt on Corporate Profitability: Evidence from French Service Sector https://ssrn.com/abstract=2191075 or http://dx.doi.org/10.2139/ssrn.2191075

Keeler, T. (1984). Theories of Regulation and the Deregulation Movement. Public Choice, 44(1), pp. 103-145. Retrieved from: www.jstor.org/stable/30023939.

Kerlinger, F. N. (1983). Foundations of Behavioral Research (2nd Edn.). New York: Holt Rinehard and Wiston Inc.

Khalid, A. (2012). The impact of Asset Quality on Profitability of Private Banks in India: A Case Study of JK, ICICI, HDFC and YES Banks. African Macroeconomic Review, 2 (1).

King, B. (2015). Can the branches be saved; Bank 3.0: Why Banking Is No Longer Somewhere You Go, but Something You Do

Kioki, C., Kingori, S., and Shikumo, H. (2017). Determinants of Financial Performance of Micro-finance Banks in Kenya; Research Journal of Finance and Accounting.

Kiran1, K. P. and Jones, T. M. (2016). Effect of Non-Performing Assets on the Profitability of Banks – A Selective Study International Journal of Business and General Management (IJBGM), 5(2), pp. 53-60. ISSN (E): 2319-2275.

Kireti, G. W., andSakwa, M. (2014). Socio-economic effects of Micro-finance services on women: The case of rosewo Micro-finance, Nakuru County, Kenya. International Journal of Academic Research in Economics and Management Sciences, 3(3), 43.

Knight, F. H. (1921). Risk, Uncertainty and Profit. NY Sentry Press. Google Scholar.

Kombo K, Njuguna A (2017) Importance of capital adequacy requirements in Basell III framework for commercial banks in Kenya; Americal Joournal of Finance, ISSN 2520-0445 (online) Vol 1 issue 4 no 3 pp 23-44

Kondo, K. (2017). Does Branch Network Size Influence Positively the Management Performance of Japanese Regional Banks? Munich Personal RePEC Archive (MPRA), Available Online at https://mpra.ub.uni-muenchen.de/81257/ MPRA Paper No. 81257, posted 09 Sep 2017 16:45 UTC.

Kothari, C. (2018). Research Methodology: Methods and Techniques, (2nd Ed). New Delhi: New age International Publishers. Application. Upper Saddle River, N.J.: Merrill.

Kultys, J. (2016). Controversies about Agency Theory as Theoretical Basis for Corporate Governance; Oeconomia Copernicana 7(4) 613-634 Doi: http//dx.doi.org/10.12775/oec.2016.034 ISSN 2353-1827.

Kwiatkowski, D., Phillips, P. C., Schmidt, P., and Shin, Y. (1992). Testing the null hypothesis of stationarity against the alternative of a unit root: How sure are we that economic time series have a unit root?. Journal of econometrics, 54(1-3), 159-178.

Kyereboah-Coleman, A. (2010). The impact of capital structure on the performance of Micro-finance institutions. The Journal of Risk Finance, 8(1), pp. 56-71.

Laffont, J., and Guessan, T., (2000). Regulation and Development. Group Lending with Adverse Selection. European Economic Review. 44, pp.773-784.

Lancaster G., Dodd S. & Williamson, P. (2010). Design and Analysis of Pilot Studies: Recommendations for Good Practice. *Journal of Evaluation in Clinical Practice 10(2)307–312.*

Ledgerwood et al., (2013). The new Micro-finance handbook: a financial market system perspective. Washington DC; World Bank Group.

Ledgerwood, J., and Lehman, J. (2013). Payment services and delivery channels; The New Micro-finance Handbook: A Financial Market System Perspective. Washington, DC: World Bank. doi: 10.1596/978-0-8213-8927-0.

Lelissa, T. B., and Kuhil, A. M. (2018). Are Regulatory Measures Influencing on Bank Performances? The Ethiopian Case. Arabian J Bus Management Review, 8, (1), 1000332. ISSN: 2223-5833.

Lopez J (2008) What is Liquidity Risk; Economic Research; Federal Reserve Bank of San Francisco

Lotto, J. (2018). The Empirical Analysis of the Impact of Bank Capital Regulations on Operating Efficiency. International journal of financial studies 6(34). Managerial Finance 43(6), pp. 646-662. Emerald Publishing Limited 0307-4358

Maimbo, M., Kirkpartrick, C., and Martin, B. (2002). Prudential Regulation; Finance and Development Research Programme.

Mathuva, D. M. (2009). Capital adequacy, cost income ratio and the performance of commercial banks: The Kenyan Scenario. International Journal of Applied Economics and Finance, 3 pp. 35-47.

Mbucho C, Senaji, T. (2015). Influence of credit management on the loan performance among Micro-finance institutions in Kenya. The strategic journal of Business and change management, 2(78) pp. 921-939.

Menicucci, E., and Paolucci, G. (2016). The determinants of bank profitability: empirical evidence from European banking sector; Journal of Financial Reporting and Accounting, 14(1), pp. 86-115. Emerald Group Publishing Limited. DOI 10.1108/JFRA-05-2015-0060.

Micro-finance Act of Kenya, 2008

Mireku, K., Sakyi, E. A., and Agana, J. A. (2018). Does Commercial banks presence enhance profitability in Ghana? Global Business review, 19(6), pp.1449-1461 sage journals

Monyi, J. (2017). Determinants of Financial Performance of Deposit Taking Micro-finance Institutions in Kenya (Unpublished MBA Project.).

Moosa, I. A. (2015). Definition and Theories of Regulation. In: Good Regulation, Bad Regulation. Palgrave Macmillan Studies in Banking and Financial Institutions. Palgrave Macmillan, London; https://doi.org/10.1057/9781137447104_1.

Muganga, D. (2010). The Role of Regulation and Supervision of Micro-finance Institutions: evidence From South Africa and its Implications for the Development of Non-Deposit Taking Micro-finance Regulation in Kenya' Publication of the State University of Bergamo – Italy (4th Edition).

Mugenda, O. M., and Mugenda, A. G. (2003). Research methods. Quantitative and qualitative approaches. Nairobi: Nairobi, Acts Press.

Mugun, W., Odhiambo, S., and Momanyi, G. (2019.) Effect of Debt Equity Ratio on financial performance of Micro-finance Institutions in Kenya; International Journal of Research and scientific Innovation, 5 (8). ISSN 2321-2705

Muhindi, K. A. and Ngaba, D. (2018). Effect of firm size on financial performance on banks: Case of commercial banks in Kenya. International Academic Journal of Economics and Finance, 3(1), 175-190

Muriithi, J. G., and Waweru, K. M. (2017). Liquidity risk and financial performance of commercial banks. International Journal of Economics and Finance, 9 (3), pp.256-265.

Muriu, P. W. (2012). What Explains the Low Profitability of Micro-finance Institutions in Africa; African Journal of Social Sciences, 2(3), pp 85-115. ISSN 2045-8460 (online)

Musa Al Nawaiseh I (2020) The Effect of Firm's Age, Size and Growth on Its Profitability: Evidence from Jordan; European Journal of Business and Management www.iiste.orgISSN 2222-1905 (Paper) ISSN 2222-2839 (Online) Vol.12, No.5.

Musembi, D., Ali, A., and Kingi, W. (2016). Effect of liquidity risk determinants on the financial performance of commercial banks listed at the Nairobi Securities Exchange (NSE). Imperial Journal of interdisciplinary research, 2(11), pp. 2142 - 2154.

Musiega, M., Olweny, T. Mukanzi, C., and Mutua, M. (2017). Influence of Liquidity Risk on Performance of Commercial Banks in Kenya. Journal of Economics and Finance (IOSR-JEF). 8(3), pp.67-75. Available at: www.iosrjournals.org. e-ISSN: 2321-5933, p-ISSN: 2321-5925

Mutesi S (2020) Contributions of Loan Portfolio Management on Financial Performance of Commercial Banks in Rwanda; International Journal of Scientific Research Publications 10 (06) 356-365

Muthinja, M. M., and Chipeta, C. (2018). What Drives Financial Innovations in Kenya's Commercial Banks? An Empirical Study on Firm and Macro-Level Drivers of Branchless Banking; Journal of African Business, vol 19(3), pp. 385-408.

Mwai, E. N. et al (2017). The Relationship between Capital Requirement and Financial Performance of Commercial Banks in Kenya. International Journal of Business and Social Science, 8(3).

Mwega, F. M. (2011). Financial regulation in Kenya: Balancing inclusive growth with financial stability, 2014.

Nakai, M., and Weiming, K. (2011). Review of Methods for Handling Missing Data in Longitudinal Data Analysis. International Journal of Mathematics Analysis. 5(1), pp.1-13.

Nassreddine, G., Fatma, S., and Anis, J. (2013). Determinants of Bank Performance: Viewing Test by Cognitive Mapping Technique a case of Biat. International Review of Management and Business Research, 2(1), pp. 20-35.

Ndambu, J. (2011). Does regulation increase Micro-finance performance in Sub-Saharan Africa. Frankfurt School of Finance and Management, Frankfurt.

Newing, H. (2018). *Conducting Research in Conservation: A Social Science Perspective.* New York: Routledge.

Nikolaou K (2009) Liquidity Risk concepts, definitiona and Interactions; European Central Bank working paper series No.1008

Nkuah, E. (2015). The Effect of Loan Portfolio Quality on the Performance of Banks in Ghana. Thesis available at: http://hdl.handle.net/123456789/8668.

Nunnally, J., & Bernstein, I. (1994). *Psychometric Theory (3rd Ed.).* New York: McGraw-Hill.

Nyandoro, E. B. and Kalui, F. M. (2019). Determinants of loan portfolio quality in investments groups: A case study of Sidian Bank. International Academic Journal of Economics and Finance, 3(4), pp. 1-15.

Nyanzu, F., Peprah, J. A., andAyayi, A. G. (2019). Regulation, outreach, and sustainability of Micro-finance institutions in Sub Saharan Africa: A multilevel analysis. Journal of Small Business Management, 57, 200-217.

Odunga, R. M. Nyangweso P. M. and Nkobe, D. (2013). Liquidity, capital adequacy and operating Efficiency of Commercial Banks in Kenya Research. Journal of Finance and Accounting, 4(8), pp.76-80.

OECD (2011). Regulatory Policy and Governance: Supporting Economic Growth and Serving the Public Interest, OECD Publishing. http://dx.doi.org/10.1787/9789264116573-en.

Okpala, K. (2013). Consolidation and business valuation of Nigerian banks: What consequences on liquidity level. International Journal of Business and Social Science, 4 (12), pp. 312-320.

Oladejo, M.O. and Oladipupo, A. U. (2011). Capital regulation and performance of Nigerian banks; need for review: Journal of Emerging Trends in Economics and Management Sciences, 2(3). Available at: https://hdl.handle.net/10520/EJC134171.

Olajide, A. M and Anthony, O. S. (2017). Branch network growth and banks performance in (1981-2013). British Journal of Marketing Studies 5(2), pp.39-49. European Centre for Research Training and Development UK (www.eajournals.org) 39 ISSN 2053-4043(Print), ISSN 2053-4051(Online)

Olga, G., Michel, D., and Ripsa, K. (2019). The impact of liquidity risk on bank profitability: some empirical evidence from the European banks following the introduction of Basel III regulations; Accounting and Management Information Systems,18(4), pp. 455-485. DOI: http://dx.doi.org/10.24818/jamis.2019.04001

Omino, G. (2005). Regulation and Supervision of Micro-finance Institutions in Kenya. Essays on Regulation and Supervision of the Central Bank of Kenya (March)

Onuonga, M. S (2014). The analysis of profitability of Kenya's top six commercial banks: internal factor analysis. American International journal for social sciences, 3(5), pp. 94-103.

Orazalin, N., Mahmood, M., and Lee, K. J. (2016). Corporate governance, financial crises and bank performance: lessons from top Russian banks; corporate governance, 16(5), pp. 798-814. Emerald Group Publishing Limited, ISSN 1472-0701 DOI 10.1108/CG-10-2015-0145

Otero, L., Alaraj, R., and Lado-sestayo, R. (2019). How corporate governance and ownership affect banks' risk-taking in the MENA countries? European Journal of Management and Business Economics, 29(2), pp. 182-198. Emerald Publishing Limited e-ISSN: 2444-8494 DOI 10.1108/EJMBE-01-2019-0010

Oyong, L. (2016). Determinants Distribution of Financing and the Implications to Profitability: Empirical Study on Cooperative Sharia Baitul Maal waTamwil (BMT) in Indonesia

Özcan I and Ersan E (2022) Bank Age and Financial Performance: Is the Relationship Linear or Nonlinear? Evidence From Listed and Unlisted Commercial Banks in China1; Research of Financial Economic and Social Studies, Vol.7 No.4, ISSN: 2602 – 2486.

Parvin, S., Chowdhury, A., Siddiqua, A., & Ferdous, J. (2019). Effect of Liquidity and Bank Size on the Profitability of Commercial Banks in Bangladesh. Asian Business Review, 9(1), 7–10. https://doi.org/10.18034/abr.v9i1.219https://doi.org/10.18034/abr.v9i1.219.

Patino, C. M., & Ferreira, J. C. (2018). Inclusion and exclusion criteria in research studies: definitions and why they matter. Journal of Bras Pneumol 44(2), 84. https://doi.org/10.1590/s1806-37562018000000088.

Patten, M. (2004). *Understanding Research Methods: An Overview of the Essentials.* Los Angels: C.A., Pyrzak Publishers.

Peltzman, S. (1976). Towards a more general theory of regulation. Journal of law and economics, 19(2), pp. 211-240. DOI 10.3386/w0133 NBRE working paper no 133. Available at: https://www.nber.org/papers/w0133.

Posner, R. (1974). “Theories of Economic Regulation.” Bell Journal of Economics and Management Science, 5(2), pp. 335–358.

Posner, R. A. (1974). "Theories Of Economic Regulation," Bell Journal of Economics, 5(2), pp. 335-358. (DOI): 10.3386/w0041 available at https://www.nber.org/papers/w0041

Punch, P. (2003). *Developing Effective Research Proposals*. London: Sage Publications.

Rahman, W. A. A. (2010). An overview of Micro-finance: History and evolution, definition and practice. Ahfad Journal, 27(2), 3-21.

Republic of Kenya (2004). Ministry of planning and National Development. Investment program for economic recovery strategy for 2003 - 2007.

Republic of Kenya, Micro-finance (Deposit Taking Micro-finance Institutions) Regulations, (2008). Republic of Kenya, Micro-finance, Act, 2006.

Richard, E., Chisogira, M., Kaijage, E., Peterson, C., and Bohman, H. (2008). Credit risk management system of a commercial bank in Tanzania. International journal of emerging markets, 3(3), pp. 323-332.

Ritu, C. (2014). Issues in Micro-finance Sector in India; International Journal in Commerce and Social Sciences, 1(3).

Rukaria, G. K. (2015). Challenges affecting transformation of Micro-finance institutions into deposit taking Micro-finance institutions in Kenya. Unpublished thesis.

Rupa R (2018) Is Age a Criterion for Sustenance of Micro-finance Institutions? Journal of Finance and Accounting Volume 4, Issue 1, January-June 2017, pp. 86-101 doi: 10.17492/mudra.v4i01.9783.

Rweria, L. (2011). The need for regulation of Micro-finance institutions in Kenya. (Thesis) Kenyatta University institutional repository.

Saeed, M. S., and Zahid, N. (2016). The impact of credit risk on profitability of commercial banks. Journal of business and financial affairs.

Said, A. E. E. (2015). The Regulatory and Supervision Framework of Micro-finance in Kenya, International Journal of Social Science Studies, 3(5).

Salike, N. (2018). Determinants of bank profitability, role of poor asset quality in Asia, China, Finance review International, pp. 216-231. DOI: 10.1108/CFRI.10.2016.0118.

Salike, N., Jiaotong, X., China, S., Biao A., and Huazhen, L. L. P. (2018). China Finance Review International, 8(2), pp. 216-231. DOI 10.1108/CFRI-10-2016-0118.

Salles, R., Belloze, K., Porto, F., Gonzalez, P. H., and Ogasawara, E. (2019). Nonstationary time series transformation methods: An experimental review. Knowledge-Based Systems, 164, 274-291.

Saunders, M., Thornhill, A., & Lewis P. (2009). *Research Methods for Business Students (5th Ed.)*. London: Thousand Oaks, Sage.

Scheffe, H. (1959). The Analysis of Variance. New York: John Wiley and Sons.

Schindler, P. (2003). Business Research Methods. Boston: McGraw Hill.

Sealey, C. W. (2008). "Can delegating bank regulation to market forces really work?" Chen, A.H. (Ed.) Research in Finance, 24, pp. 27-56. Available at: https://doi.org/10.1016/S0196-3821(07)00202-X.

Seitzer, A. J. (2018). The functions of Australian Branch networks: the diversification of risks and spatial allocation of capital, Australian Economic History review; 58(3), pp. 338-361 (Special issue markets, Money and Multinationals).

Sengupta, R. and Aubuchon, C. P. (2008). The Micro-finance revolution: An overview. Federal Reserve Bank of St. Louis Review, 90(1), January/February.

Sheefeni, J. P. (2016). Impact of Bank –Specific determinants on Commercial bank's liquidity in Namimbia. Business, Management and Economics Research, 2(8), 155-162.

Singh, V., and Padhi, P. (2019). Factors influencing outreach performance of Micro-finance sector in India; Asia –Pacific Journal of management research and innovation, 15(4), pp. 162-176.

Spratt, S. (2013). Financial Regulation in Low-Income Countries: Balancing Growth with Stability. Part 1 and 2. Unpublished.

Stigler, G. (1971). The economic theory of regulation, Bell Journal of Economics and Management Science, 2, 3–21.

Stigler, G. J. (1970). The Optimum Enforcement of Laws. Journal of Political Economy, V. 78, N. 3, P. 526-536.

Stiglitz, J. E., Weiss, A. (1981). Credit rationing in markets with imperfect information. The American Economic Review, 71(3), pp. 393-410.

Sulub S A (2014). Do The Bank Size, age and leverage are important factors to determine its profitability!

Swamy, V. (2017). Analyzing the topography of financial regulation; Journal of Financial Economic Policy, 9(4), pp. 475-515. DOI 10.1108/JFEP-06-2017-0058.

Swamy, V. (2017). Analyzing the topography of financial regulation; Journal of Financial Economic Policy, 9(4), pp. 475-515. 1757-6385 DOI 10.1108/JFEP-06-2017-0058.

Tharu, Nanda & Shrestha, Yogesh. (2019). The influence of bank size on profitability: An application of statistics. International Journal of Financial, Accounting, and Management. 1. 10.35912/ijfam. v1i2.82.

Thiongo, P. K, Matata, K., and Simiyu. A. (2016). Effect of Loan Portfolio Growth on Financial Performance of Commercial Banks in Kenya; Imperial journal of interdisciplinary research, 2(11).

Tochukwu, O. R. (2016). Capital adequacy and risk management: A study of the Nigerian banking sector. International Journal of Innovative Science, Engineering and Technology, 3(7), pp. 342 - 354.

Tripodis, Y., andPenzer, J. (2007). Single season heteroscedasticity in time series. Journal of Forecasting, 26(3), 189-202.

Triwulan B; Chandrarin G & Asih, P(2019) The Effect of Company Size on Company Profitability and Company Value: The Case of Manufacturing Companies, International Journal of Economics & Business Administration (IJEBA), International Journal of Economics & Business Administration (IJEBA), vol. 0(2), pages 251-256.

Uche, C. U. (2001). The theory of regulation: a review article. Journal of Financial Regulat1on and Compliance, 9(1) pp. 67-80.

Uche, C. (2001). "The theory of regulation: A review article", Journal of Financial Regulation and Compliance, 9(1), pp. 67-80. https://doi.org/10.1108/eb025063

UN (2013). Micro-finance in Africa: Overview and Suggestions for Action by Stakeholders. A Publication by the United Nations Office of Special Adviser on Africa (February)

Vahid, N., Dehghanpour M, and Nasirizadeh, H. (2013). Comparison between accounting profit and economic profit and its effect on optimal point of production. European Online Journal of Natural and Social Sciences, 2(3), pp. 493-499.www.european-science.com; ISSN 1805-3602 493

van Gržeta*, Saša Žiković and Ivana Tomas Žiković (2023) Size matters: analyzing bank profitability and efficiency under the Basel III framework; Financial Innovation (2023) 9:43 https://doi.org/10.1186/s40854-022-00412-y.

Van, G. H and Sonja, B. B. (2020). Analyzing Banking Risks, a Framework for Assessing Corporate Governance and Risk Management; 4th Ed. Washington, World Bank Doi: 10.1596/978-1-4648-1446-4

Velicer, W. F., and Fava, J. L. (2003). Time Series Analysis. In J. Schinkaand W. F. Velicer (Eds.), Research Methods in Psychology (581-606). Volume 2, Handbook of Psychology (I. B. Weiner, Editor-in-Chief.). New York: John Wiley and Sons.

Viscusi et al (2000). Construe “regulation is the use of the power of the government i.e. power to coerce for the purpose of restricting the decisions of economic agents”, 2(3).

Viscusi, K., Vernon, J., and Harrington Jr., J. (1995). Economics of Regulation and Antitrust, 2nd ed., Cambridge, MA: The MIT Press.

Vousinas, G. L. (2015). Supervision of financial institutions the transition from Basel I to Basel III. A critical appraisal of the newly established regulatory framework; Journal of Financial Regulation and Compliance, 23(4), 2015 pp. 383-402. 1358-1988 DOI 10.1108/JFRC-02-2015-0011

Wafula, N. D., Mutua, M. S., and Musiega, G. M. (2017). Influence of Financial Performance on Sustainability of Micro-finance Institutions in Kenya; International Journal of Management and Commerce Innovations, 4(2), pp.295-302. ISSN 2347-7585

Wallen, N. E., & Fraenkel, J. R. (2001). *Educational Research: A Guide to the Process.* New Jersey: Lawrence Erlbaum Associate, Inc.

Wanambisi, A. N., and Bwisa, H. M. (2013). Effects of Micro-finance lending on business performance: A survey of micro and small enterprises in Kitale municipality, Kenya. International Journal of Academic Research in Business and Social Sciences, 3(7), 56.

Waweru, N. M. and Kalani, V. M. (2009). Commercial Banking crises in Kenya: Causes and Remedies, Global journal of finance and Banking issues, 3(3), pp. 15 – 20.

Weston, J. (1950). A Generalized Uncertainty Theory of Profitability; The American Economic Review 40(1), pp.40-60. Available at http://www.jstor.org/stable/1802809

White, R. (2014). The Prudential Regulation of Financial Institutions: Why Regulatory Responses to the Crisis Might Not Prove Sufficient OECD Economics Working Paper NO. 1108; https: //dx.doi.org

Yunus, M. (2003). Banker to the Poor: Micro-Lending and the Battle against world poverty. London: Aurum Press Limited. https://www.ada-Micro-finance.org/

Yunus, M., and Weber, K. (2007). Creating a World Without Poverty: Social Business and the Future of Capitalism., New York: Public Affairs.

APPENDICES

Appendix I: List of Micro-finance Institutions

SN	Institution	Year Licensed	Year Established
1	Faulu Micro-finance Bank Limited	2009	1992
2	Kenya Women Micro-finance Bank Limited	2010	1981
3	SMEP Micro-finance Bank Limited	2010	1975
4	Sumac Micro-finance Bank Limited	2013	2004
5	U and I Micro-finance Bank Limited	2013	2008
6	Uwezo Micro-finance	2010	2007
7	Rafiki	2011	2011
8	Caritas	2014	2015
8	Key (Remu)	2010	2010
10	Daraja	2014	2015
11	Maisha	2016	2016
12	Century	2012	2012
13	Choice	2015	2015

Appendix II: Data Collection Instrument

Year: ……

Institution	Equity	NI	Assets	Liabilities	Gross NPL	Net Advances	Loan loss provision	GLP	Customer deposits	Branches
	Ksh "M"	Ksh "M"	Ksh "M"	Ksh "M"	Ksh "M"	Ksh "M"	Ksh "M"	Ksh "M"	Ksh "M"	No.
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										

Appendix III: Measurement of Variables

Category	Variable	Source	Measurement	Formulae
Dependent	Profitability	Amina and Fedhila (2018)	Return on Assets	Net Income/Assets
Independent	Quality of Loan Portfolio	Waweru and Kalani (2009); Monyi J., 2017	PAR>30 days	Gross NPL>30 /Advances
Independent	Capital Adequacy	Boateng et al (2019); Habimana O (2015)	D/E Ratio	Total Liabilities/ Equity
Independent	Liquidity Risk	Olga G et al (2019);	Liquidity Risk Ratio	(Advances-customer deposits)/Assets
Independent	Number of Branches	Chikalipah S (2019);	Number of Branches	Number of Branches
Control	Size of the Bank		Asset Base	Total Assets
Control	Age of the Bank		Number of Years since Establishment	Number of Years

Appendix IV: Research License

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **920181**

Date of Issue: **22/December/2023**

RESEARCH LICENSE

This is to Certify that Ms.. VALERIA K ONSANDO of Moi University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in on the topic: Effect of Financial Regulatory Requirements on profitability of microfinance institutions for the period ending : 22/December/2024.

License No: **NACOSTI/P/23/32166**

920181

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions