

**EFFECT OF INTEREST RATE CAPPING ON GROWTH OF  
MICROFINANCE BANKS IN KENYA**

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**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT  
OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE  
OF MASTER OF SCIENCE IN FINANCE, SCHOOL OF BUSINESS,  
UNIVERSITY OF NAIROBI**

**DECEMBER, 2018**

## **DECLARATION**

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

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## **ACKNOWLEDGEMENT**

I thank God for the strength and guidance He gave me during my studies. My gratitude to Dr. Winnie Nyamute for her supportive and constructive guidance in the research methodology. To my classmates who we memories to treasure. To the Microfinance Banks for availing data information for the research.

## **DEDICATION**

I dedicate this project to my wife Mercy Kimani for being a strong pillar throughout my studies. Your encouragement, emotional and material support throughout my studies is immeasurable.

To my lovely children Nathan and Neriah for the fun time I sacrificed for reading, you took me to the library. I appreciate your effort.

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## **ABBREVIATIONS AND ACRONYMS**

<b>AMFI</b>	Association of Microfinance Institutions
<b>ANOVA</b>	Analysis of Variance
<b>CAR</b>	Cumulative Abnormal Returns
<b>CBK</b>	Central Bank of Kenya
<b>EMH</b>	Efficient Market Hypothesis
<b>GDP</b>	Gross Domestic Product
<b>KCB</b>	Kenya Commercial Bank
<b>KSH</b>	Kenya Shillings
<b>MPT</b>	Modern Portfolio Theory
<b>NSE</b>	Nairobi Securities Exchange
<b>SPSS</b>	Statistical Package for Social Sciences
<b>USD</b>	United States Dollar

## ABSTRACT

The question of whether shifts in interest rates affect the growth of firms has been widely examined in both academic and policy circles and there are proponents and opponents of interest rate capping. Proponents argue that the introduction of interest rate ceilings protect the public interest through ensuring a reasonable and fair interest rate advanced on loans. Alternatively, opponents argue that financial liberalization results to potential gains in terms of efficiency in investment resources' allocation. The aim of this study was to ascertain the effect of interest rate capping on growth of microfinance banks in Kenya.

The population for the study was all the 11 microfinance banks operating in Kenya as at December 2017. The independent variables for the study were Interest rate capping as measured by a dummy, asset quality as measured by the ratio of non-performing loans to total gross loans, liquidity as measured by the ratio of liquid assets to short term liabilities and capital adequacy as measured by the ratio of core capital to total capital deposits. Growth of microfinance banks was the dependent variable and was measured by profitability, customer deposits and loan book value. Secondary data was collected over a period of 10 quarters (5 quarters before interest rate capping and 5 quarters after interest rate capping). The descriptive cross-sectional research design was employed for the study and the relationship between variables established using multiple linear regression analysis. Data analysis was undertaken using the SPSS software. The results of the study produced R-square values of 0.452, 0.331 and 0.383 for profitability, customer deposits and loan book value respectively. This implies that the selected independent variables (interest rate capping, capital adequacy, asset quality and liquidity) explains 45.2%, 33.1% and 38.3% of profitability, customer deposits and loan book value of microfinance banks respectively. The remaining percentage is explained by other factors not covered in this research. ANOVA results show that the F statistics were significant at 5% level with p values of 0.000 for all the three regression models. Therefore the three models were fit to explain the association between the selected variables. The findings also showed that firm liquidity and asset quality have a significant effect on profitability of microfinance banks, asset quality has a significant effect on customer deposits while liquidity, asset quality and capital adequacy have a significant effect on loan book values. Interest rate capping was found to be an insignificant determiner in all the three models as shown by high p values. This study recommends that when policy makers are considering repealing of interest rate capping due to its negative effect in the economy, profitability, customer deposits and loan book value of microfinance banks should not be a reason to repeal as they are not significantly affected by interest rate capping.

# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 Background of the Study**

Growth of a business is an important component towards the success of the firm. To achieve success and remain in business; both growth and profitability are essential ingredients for the firm's survival and to remain attractive to investors and analysts (Hirtle & Stiroh, 2007). For a business to flourish it needs to have stable earnings to facilitate its growth and expansion as it continues operating. Apart from business earnings, it is essential to have knowledge of the external environment in which the firm operates (Charlene, 2005). Rate of Interest is one of crucial macroeconomic variables that are believed to affect growth of firms, which is more associated with the growth of economy (Amarasinghe, 2015). Since the interest capping affects prices of all commodities including loans and savings, it is expected that the same can have an effect on the growth of firms (Adjasi & Biekpe, 2006).

This study was based on several theories such as Malkiel and Fama (1970) Efficient Market Hypothesis (EMH) which argues that the existing price of a stock indicate the information acquired about an organization's value and it is difficult to make extra earnings by use of available information. The EMH theory supports this study in that the growth of the microfinance sector reflects happenings in the macroeconomic variables disparity. Another theory is the Markwitz (1952) Modern Portfolio Theory (MPT) that links the macroeconomic variables to financial performance and in effect growth. The study is also based on theory of rational expectations which uses statistical tools to show that businesses and workers shape the economy by updating and interpreting information regarding the

future of the economy. Therefore, government monetary policies can be anticipated which affects those policies' outcomes (Chandra, 2008).

In Kenya, the bill to cap interest rates was assented to law on the 24th August 2016. This move in regulating interest rates saw the introduction of interest rate capping on lending rates at 4.0% above the CBR and a floor on the deposit rates at 70% of the CBR (CMA, 2016). There have been arguments that interest rate capping restrictions could result in optional lending by the financial institutions like lending to government or absolute withdrawal from specific locales such as rural areas or expensive market segments or rural areas when the capping becomes unprofitable. The current study will investigate whether the capping of interest rates in Kenya has affected growth of microfinance institutions.

### **1.1.1 Interest Rate Capping**

Rate of interest is the cost incurred by a borrower for using money borrowed from financial institution or lender (Chovancova, 2001). An interest rate cap on the other hand refers to a ceiling advanced on interest rates (Villegas, 1982). It determines the highest interest rate that could be advanced on loans by banks. Interest rate capping is used by the government to regulate the financial sector. An interest rate cap can also be defined as interest rate that are acceptable to vary, but which can't exceed a declared interest cap. The interest rate can thus fluctuate up and down, but cannot at all go above the cap rate (Ariemba, Kiweu & Riro, 2015). Capping of interest rates indicates that, some lenders were restricted from issuing loans that attract a higher interest than the one accepted by law. This is mostly common when it comes to issues of transparency, limited disclosure need as well as low financial knowledge (Miller, 2013).

According to Miller (2013), several reasons may compel the governments choose to apply interest rate caps, many of which relate to politics and economy. One may be to finance an industry in places with market failure or in areas that require more financial resources. Market failures are brought about by market information asymmetries, adverse selections moral hazards and failure by financial institutions to distinguish between low and high risk clients. Interest rate caps are mechanisms to support a sector until it becomes self-sustainable.

The capping of interest rates is also essential in protecting the public from exploitation from lenders, as well as protecting public interest through provision of affordable loans, thereby increasing investment and income flow. Also, the capping of interest rates is an avenue of considering all parties in lending, including low-income customers, hence a fight of social harm (OFT, 2010). Although it is theoretically easy, there is a large disparity in the ways or methods that the government initiates the capping of interest rates limits in loans. Many states are basing their own strategy on the religion related rules while others are using the flexible approaches that suit their economy. Some are just assumptions like, for instance no loans with interest rates exceeding say, 40% interest per annum, or 3% per month, instead of introducing a rigid rate that seem to be discriminative as well as exploitative. The sense of this is that, capping of interest rates with a rigid rate, also impact the economy at large extends, hence reducing the surplus that is commonly used for investments (Helms & Reille, 2004).

### **1.1.2 Firm Growth**

Naceur and Goaid (2001) defined growth as an approach used by a firm to increase its revenues with greater product sales or service income. Lee (2009) defines growth as

increasing profitability through cost minimization. Therefore, firm growth can be described as increased firm sales, business expansion through merger and acquisition, growth in profit, product and service development, diversification and an increment in number of firm staffs. Firm growth in financial terms is the increase in business revenues or sales.

According to Gudda (2003), firm growth can be seen as set of procedures of enhancing some significant measure of an enterprise's success. It can be acquired by boosting the core business or firm's revenue with greater product sales or service income or raising profitability of the operation through cost minimization.

Loderer (2009) posits that growth can be determined using various indicators; the mostly used include assets, sales, employment, market share, profit and physical output. Sales are universally acceptable indicator of a firm's growth. Assets value depends on the capital strength of an industry. The firm's market share might be ambiguous this is because market share differences might not be relevant especially for small sized firms hence making a comparison of firms market shares for firms that operate in dissimilar markets might not lead to valid conclusion. It is difficult almost impossible to compare physical output across industries due to complexity and the nature of the firms operations in different sectors. Profits are universally acceptable measure of growth since they consider various aspects of the firm apart from its size.

There are no specific measures of a firm growth however going by the changes that occurs in the financial statements these are the financial position statement and comprehensive income statement, one can determine whether the firm is at a high level of growth or not. The key indicators to establish the growth of a firm is increase in customer deposits, total assets and the liabilities held by a firm; short term liabilities and long term. Long-term

liabilities are highly utilized when the firm opts to expand externally (Loderer, 2009). This study will measure firm growth using loan book value and savings.

### **1.1.3 Interest Rate Capping and Business Growth**

McKinnon (1973) theory argues that macro-economic variables for instance real interest rates, exchange rates and inflation should be monitored as they influence the diverse economic fundamentals and hence economic status. McKinnon posits that holding interest rates below market equilibrium leads to an increase in investment' demand but the real investment may remain unaffected. However, according to market efficiency theory the prices of all variables should not be influenced by other factors apart from demand and supply (Fama, 2000).

Since interest rates capping tends results in adverse biases and market distortion, financial institutions are more comfortable advancing loans to low risk clients which creates massive inefficiencies in the process of financial intermediation. Ramsey (2013) argues that this discrimination eliminates those in dire need of financial support due to being considered high risk borrowers. However, financial institutions could still make profits despite government's interest rate capping by undertaking other money generating activities such as non-funded income and cost reductions. Interest rate capping restrictions may cause alternative lending by the financial sectors like lending to the government or absolute withdrawal from specific locales like rural areas or expensive market segments or rural areas when the capping becomes unprofitable (Helms & Reille, 2004).

Zhou (1996) contradicted the perceived notion that there exist an association between interest rate, exchange rate, economic growth, inflation and business growth. His study tried to demonstrate that there are other fundamental factors affecting growth most

importantly the efficiency of the market that result in the market self-regulating due to availability of all fundamental market information and hence no one has the upper hand or the ability to beat the market. The hypothesis that firm growth move one-for-one with ex ante interest rates is rejected.

#### **1.1.4 Microfinance Banks in Kenya**

The Microfinance Act (2006) was revised by removal of the term institution which was then substituted to Microfinance bank licensed under this Act. Microfinance bank is a company that is licensed to conduct Microfinance bank business. This kind of a bank is licensed by Central Bank of Kenya (CBK). Association of Microfinance Institutions (AMFI) seeks to increase the capacity of the Kenyan Microfinance industry. The formation of AMFI was intended to ensure a binding voice to lobby Kenya government for better policies and to share information and experiences with both local and global actors. Microfinance Act, 2006 provides a supervisory and regulatory framework for Microfinance banks in Kenya. This act became active from 22 May 2008, its main role being licensing and supervision of Microfinance banks. It enables Microfinance banks to mobilise customer deposits from the public and lend money to gain interest income which is one of their core activities (CBK, 2015). The main aim of microfinance institutions is to ensure that poor households have adequate access to high-quality financial services for example credit, savings, insurance and fund transfers (Kavoo, 2013).

Over the last decade, Kenya has faced a rapid growth of Microfinance banks as a result of the adoption of new technology and financial innovation. This has led to the introduction of new products and services which has increased accessibility, flexibility and convenience of banking products and services. Financial liberalization has promoted competition in the



banking sector through fair and equitable banking practices with a strong emphasis on access to banking services. Customer needs to keep on changing; banks are looking for better ways to address these needs by tailoring their products or services to meet such needs (Muronya, 2013). The introduction of interest rate capping in September 2016 regulated the rate at which micro-finance banks can charge for loans and the amount they can pay for customer deposits.

## **1.2 Research Problem**

The question of whether shifts in interest rates affect the growth of firms has been widely examined in both academic and policy circles and there are proponents and opponents of interest rate capping. Proponents argue that the introduction of interest rate ceilings protect the public interest through ensuring a reasonable and fair interest rate advanced on loans. On this context, interest rate caps could also be beneficial in the sense that it limits credit access to some low-income and impaired consumers, since they mitigate social harm (OFT, 2010). Bernanke and Kuttner (2005) also support this view by arguing that since prices charged for credit can be anticompetitive and arbitrary and thus higher than the actual lending cost, lower interest rate capping allows lenders to operate. Alternatively, opponents argue that financial liberalization results to potential gains in terms of efficiency in investment resources' allocation. Galindo, Weiss and Schiantarelli (2007) argue that financial liberalization such as credit controls' reduction improves the efficiency of investment in most instances leading to growth of the affected firms.

Over the last decade, Kenya has faced a rapid growth of Microfinance banks as a result of the adoption of new technology and financial innovation. This has led to the introduction of new products and services which has increased accessibility, flexibility and convenience

of banking products and services. Financial liberalization has promoted competition in the banking sector through fair and equitable banking practices with a strong emphasis on access to banking services. However, the introduction of interest rate capping in September 2016 regulated the rate at which micro-finance banks can charge for loans and the amount they can pay for customer deposits and many analysts have argued that this might affect the growth of banks and microfinance banks in Kenya.

Several studies have documented the effect of interest capping on different sectors of the economy. However, most of these studies have focused on the impact of capping on other variables apart from growth and have focused more on banks. Robinson (2010) found out in his study that bank earnings are influenced by unexpected changes in lending interest rates. Nkwoma (2014) noted that interest rates' deregulation in the Nigerian banking sector increased bank lending, which meant a high-profit margin for the banks. However, NKwoma (2014) and Zaman, et al., (2013) also cautioned against the lack of regulation to prevent banks from engaging in very risky ventures that might affect their liquidity. Nodeng, Rosenboom and Wang (2013) established the impact that government intervention on US stock performance during times of financial crisis. They found that bank capital provisions by the government had a positive influence on the performance of borrowing companies. McClain and Meier (2013) studied the costs and advantages of cap and trade, along with some examination of the actual mechanics by which the system is required to work in America. It was realized that the caps lowered financial institutions' profits and this affected the whole economy regarding developments.

In Kenya, Kiseu (2017) conducted a study on influence of interest rate capping on the amount of credit given by Kenyan commercial banks. The study found that the interest rate

control did not significantly affect how commercial banks gave their loans. Murimi (2017) conducted a study on the impacts of interest rate capping on retail credit growth on Kenya commercial banks. The findings of the study indicate that interest rate charged by commercial banks significantly affects credit growth. Othigo (2017) carried out a study on the impact of interest rate capping announcement on the stock returns. The study found that rate of interest capping has a significant negative effect on share returns. Kimunge (2017) studied on the influence of interest rate capping on stock returns at the NSE and found out that interest rate capping had a cumulative negative effect on the stock returns for commercial banks listed at the NSE. From the foregoing, it is notable that there is no consensus on the influence of interest capping on growth of microfinance banks. In addition, the studies conducted locally have concentrated on banks leaving a gap in the microfinance sector. This study sought to answer the research question: What is the effect of interest rates capping on growth of microfinance banks in Kenya?

### **1.3 Research Objective**

This study sought to determine the effect of interest rates capping on growth of Kenyan microfinance banks.

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

Potential investors as well as the existing ones in the microfinance industry will find this study useful in their investment undertakings. They shall be in a position to better appraise their investment targets and or portfolios; and so proceed to make appropriate decisions. Fund managers and financial analysts could also draw insights from the study for similar reasons as the investors as well as in making appropriate client advises or recommendations.

The study's findings will be used for future reference by researchers, students and scholars who seek to undertake studies on a similar area. It will also benefit researchers and scholars in identifying other fields of study by revealing associated topics which need more research and review of the empirical studies to determine the gaps of the study. This study greatly assists in the banking sector's financial performance.

To government and organizations such as the Capital Markets Authority and the Central Bank, in the formulation and implementation of policies and regulations governing monetary policies and interest rates to ensure stable rates so as to promote economic growth and reduce its spiral effects on the economy. This will contribute to the advancement of monetary development and improvement the economy.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

The section outlines the theoretical framework used and reviews former studies on interest rate capping and firms' growth. It entails the theoretical review, firm growth determinants, empirical review, the conceptual framework as well as the literature summary.

#### **2.2 Theoretical Framework**

Detailed knowledge of what has been done is provided by the theoretical review and it forms a framework for interpreting research results so as to prevail over former studies' imperfections. Different theories will be described and discussed in the following section. The theories are; efficient market hypothesis, modern portfolio theory and rational expectations theory.

##### **2.2.1 Efficient Market Hypothesis Theory**

The EMH postulates that the stock prices of an efficient market reveal all the available information at any given time (Fama, 1965). The ramifications of the supposition is that no investors can "beat the market" and increase unusual benefits because stocks are exchanged at their inherent value. Thus, any investor needing more gains must settle on riskier speculation choices instead of timing the market and stock choice. The theory expects brokers to be balanced and stock costs to modify rapidly to acclimatize to any new information. Afterwards in 1965, Fama verified the Random Walk Hypothesis (RWH), which agrees with the EMH. RWH argues that stock prices don't dependent on one another and follow an unpredictable pattern and thus can't be predicted by use of past market information.

Fama (1965) categorized EMH in three fundamental levels; strong form, the semi-strong form, and the weak-form efficiency. Stock prices reveal any information available, both private and public, in both strong form and semi- strong form efficiency but in weak-form efficiency, stock prices indicate the available relating historical data. Though this is the case, stock markets frequently show some patterns which can result to gains that are abnormal; these are called market anomalies

Market irregularity nullifies the expectation of EMH (Pandey, 2009). Microfinance banks among other market players, possess diverse fortitude and weaknesses of operations; thus, they may respond in different ways when given similar information, as their individual situations may command. Both anticipated and actual changes in macroeconomic variables frequently make part of the information that gets to the markets and economy. Microfinance banks should embrace this macroeconomic information to their activities quickly by may be changing their pricing levels or developing new plans.

### **2.2.2 Modern Portfolio Theory**

Portfolio theory also called MPT was directed by Markowitz (1952) “Portfolio Selection,” the paper he wrote and that was in a finance journal in 1952. It has helped in financial economics field. Before Markowitz’s work, investors in making their portfolios focused on examining dangers and values of each securities. Exhortation on normal endeavor was to perceive those securities having the best progression odds of profits impelled by base risk and building a portfolio starting with these. Anybody keen on undertaking as an investor choose the railroad stocks offered risk-remunerate which are of good highlights by using this guidance and hoarding a portfolio totally. Naturally, an incorrect conclusion would be created from this. This deduction was formalized (Markowitz, 1952).

MPT limits a predetermined measure of possessions risk versus the normal return on the property over a specific period, or either boosts the return rate for a specific dimension of investment risk by thoughtfully picking the divisions of different assets. In portfolio development, four essential steps are utilized as a guide; valuation concerning the security, allocation in connection to assets, performance estimation and optimization in connection to Portfolio. In uniting assets that are distinct without really related outcomes, MPT seeks to diminish the general irregularity of assortment return. MPT moreover undertakes that markets are systematized and investors adjusted (Daniel, Hirshleifer and Subramanyam, 1997).

Macroeconomic variables influence the overall business environment (Brueggeman & Fisher, 2011). Further, the firms' financial performance varies. Thus Microfinance management ought to be watchful for macroeconomic shifts and adopt accordingly .(Pandey, 2009).

### **2.2.3 Rational Expectations Theory**

The theory of rational expectations by Lucas 1970) applied arithmetical techniques to demonstrate the ways in which enterprises can maneuver their business strategies on the improvement their financial stability through the interpretation of figures to predict the future economic trend. Since governments policies are prone to changes within the short time possible, the prediction of the future economic outcome can be anticipated. Lucas applied the rational expectations theory to dismiss a number of orthodox financial statements of the 1970s, particularly the theories of British economist John Maynard Keynes and the efficiency of government involvement in the financial system. It could consist of the money in form of short term investments, the coins and notes currency, safe

assets, cash and bank balance held in the savings and currents accounts. The economy of a country is affected by the money in supply and therefore the monetary authority has to regulate the amount in circulation through the monetary policies. This difference the idea that government rule manipulates the resolution of people in the financial system (Madura, 2010).

According to Lucas study, the rational expectations theory has two main parts; the old hypothesis that depression is self-corrective. The moment people start hoarding money, it becomes very difficult to know that the recession has occurred. Immediately the individuals recognizes this recession, they intend to fear and the market quickly gain strengths. At this scenario, the manufacturers intend to lower prices to enhance a larger market share, and the workers also reduce their wages to please the employer, making the purchasing power of the shilling to grow. The part is that, the government involvement can only vary from ineffectualness to damage. This then means, that no change that the government can make if the businesses have not cut prices of their commodities to let the economy to take its corrections. Keynesians are then robbed of the argument that may be the central bank may be helpful in speeding upturn, but not making it happen (Madura, 2010). This theory is related to this study as it explains how government policies are ineffectual in influencing business growth and performance.

### **2.3 Determinants of Firm Growth**

Factors that influence firm growth can either be external or internal to the firms that define the level of output. The internal factors are different for each firm and determine its growth. These factors accrue due to managerial decisions with the board. External factors include; interest rates, exchange rate volatility, inflation, economic growth, money supply among



others. The internal factors include corporate governance, firm size, financial leverage, liquidity, management efficiency, capital, market power among others (Athanasoglou, Brissimis & Delis, 2005).

### **2.3.1 Interest Rates**

The interest rate is considered the outlay of funds and an increase or a decrease in interest rate could influence the savings choice of the financiers (Olweny & Omondi, 2010). According to Rehman, Sidek and Fauziah (2009), the use of an interest cap causes microfinance institutions to decrease loans and provoke many of these foundations to abscond rural areas, as a result of high cost of production and rate of perils. This in turn will lead to slowed growth of the microfinance banks. The microfinance banks can mitigate this situation by skyrocketing fees and other levies to arrest the situation. According to Barnor (2014), unexpected change in interest rate influences investing decisions, thus investors make changes in their savings arrangement, generally from capital market to fixed profits securities.

According to Khan and Sattar (2014) interest rate affects growth either positively or negatively depending on its movement. A decrease in interest rate to the depositors and an increase in spread discourage savings. Increase in interest rate to the depositor adversely affects the investment. Banking sector is the most sensitive to changes in interest rate as compared to other sectors because the largest proportion of banks' revenue comes from the differences in the interest rate that banks charge and pays to depositors.

### **2.3.2 Inflation**

Inflation negatively affects economic growth by decreasing the GDP. Whether inflation affects growth of a firm positively or negatively depends on the ability of a firm to anticipate it. When a country anticipates inflation, banks adjust the rate of interest to ensure that revenues generated are higher than the cost of operation. Banks that do not anticipate an inflation fails to make proper adjustment and as a result the cost of operations increases at a higher rate than revenue generated. Boyd, Levine and Smith, (2001) reported a negative relationship between inflation and firm growth. However Ameer (2015) asserts that most studies have found a positive impact of inflation on growth of firms.

### **2.3.3 Economic Growth**

A growing economy exhibits positive GDP which raises demand for loans (Osoro & Ogeto, 2014). Any rise in economic output may raise expected cash flows and, hence, trigger a rise in the growth rate of firms with the reverse impact during recession being justified (Kirui et al., 2014). Existing empirical evidence indicate that the financial systems of advanced nations are more efficient (Beck et al., 2003). Banking sector development is also positively related to economic stability and monetary and fiscal policies. Countries with higher income have more advanced banking sectors compared to countries with low income (Cull, 1998).

Investors are mainly concerned with GDP reports since the overall economic health could be established through its measurement. The long run implication of healthy economic growth is higher corporate profits and improvement of firm performance leading to long term growth while the short term implication is unpredictable market trends even during positive economic growth seasons (Beck et al., 2003).

### **2.3.4 Firm Specific Factors**

Firm specific factors also have an effect on their financial performance as reviewed hereunder. Capital adequacy ratio (CAR) determines the ability of the firm to overcome situations that may threaten profits. According to Kamande (2017) the level of capital adequacy directly affects bank's growth by determining its ability to expand to risky areas. The higher the CAR, the lower the risk and the higher the profitability due to ability to absorb losses and minimize risk exposure. However, over reliance on the CAR might reduce bank profitability by reducing the need for deposits and other cheaper sources of capital leading to slowed growth. Banks therefore need to ensure they maintain a quality portfolio of these assets as it determines their growth (Dang, 2011).

Asset quality shows a bank's asset risk situation and financial strength. Asset quality forecasts the degree of credit risk and among the dynamics which affects the health status of a bank. The value of assets controlled by a specific bank relies on the amount of credit risk, and the assets quality controlled through the bank also relies on liability to particular risks, tendencies on NPLs, and the cost-effectiveness of the debtors to the bank (Athanasoglou et al, 2008). Preferably, this ratio ought to be at a minimum. If the lending books are vulnerable to risk in a smoothly operated bank, this would be reflected by advanced interest margins. On the other hand, if the ratio decreases it entails that the risk is not being appropriately recompensed by margins.

Management efficiency influence firm growth and can be determined through organizational discipline, and quality of staff. It can be cited from various financial ratios for instance loan growth rate, earnings growth rate and total asset growth (Kapaya & Raphael, 2016). It can also be determined by the ration of operating expense to income

which shows the degree of inefficiency. A higher increase in the operating expense than total income indicates that the management is inefficient.

The viability in the future of a firm depends on its ability to earn adequate returns by using its assets. The ability of a firm to earn enables it to increase funds, expand capital and improve its competitive position. The earning capability can be represented by net interest rate margin which shows the difference between the cost of interest bank's borrowed capital and bank income of interest received on loans and securities (Owoputi, Kayode & Adeyefa, 2014).

Firm failures have been associated with insufficient liquidity. Holding liquid assets can help a firm to generate higher returns. Murerwa (2015) asserts that there is a positive connection between the adequate level of bank liquidity and growth. Liquid asset protect firms against deposits that might require on demand payment and thus firm liquidity minimizes risk. However, liquid assets reduce the amount of funds for lending which in turn reduces bank profitability and in essence growth indicating a negative relationship liquidity and firm growth.

Credit risks are the exposure faced by firms when customers fail to honor the debt obligations at maturity or due date. Banks are highly exposed to credit risk because the main purpose of bank existence is to grant credit facilities (Kapaya & Raphael, 2016). Thus sufficient management of credit is critical for the growth and survival of banks and failure to manage it may lead to financial distress. Magweva and Marime (2016) posit that credit risk significantly influences the return on assets of the firms by affecting the interest

income they generate. Credit risk negatively affects the growth of firms both in short and long run by reducing profits and increasing non-performing loans.

## **2.4 Empirical Review**

Many empirical studies locally and globally support the association between interest rates and growth of firms, but these studies have produced mixed results.

### **2.4.1 Global Studies**

The work of Capera, Murcia, and Estrada (2011) registered a depressing relationship between preventive restrictions on rates of interest as well as financial depth in 18 countries in Latin America over the period 1980–2008. In Nicaragua, for example, the use of an interest maximum caused microfinance institutions to decrease loans and provoked many of these foundations to abscond rural areas, as a result of high cost of production and rate of perils. They mitigated this situation by skyrocketing fees and other levies to arrest the situation since capping. In the case of Colombia, small firms are suffering due to high cost of transacting. However, currently, they are privileged since interest rates were capped, hence can now lend their products like microcredit. In Bolivia, when maximum interest rate was introduced in 2004, licensing of lending investments also went down.

Zaman et al., (2013) studied the impact on interest rate on the profitability of commercial banks in Pakistan. Twenty banks operating in Pakistan and enlisted in Karachi Stock formed the study sample. The study design was cross-sectional, and the data sources included the indexed Karachi stocks based on return, audited financial reports of the banks, publications of the State Bank of Pakistan, Press publications, and media reports. The outcome of the study confirmed that interest rate, deposit with the other banks, investment,

and loans. It was established the interest rate (a key tool of monetary policy) has a notable influence on profitability of banks. An increase in interest rates causes an increase in lending rate more than the deposit rate, which results in profit because the bank spread is high. A reduction in the interest rate causes the rate of deposit to go faster compared to the lending rate, which keeps the bank spread low.

Teker and Alp (2014) investigated the causality relation between stock market and the rates of interest in Turkey, Brasil, China and Hungary. The study findings revealed that fundamental relationship, direction varies involving maturities and states such that the Hungary market showed causal relation between the stock market and rate of interest while the China market predicated a low causal relation. However, the findings established that apart from Brazil, each returns on stock market are Granger cause of 3-month T-bill rates and the causality relationship of T-bonds between countries' indices returns is few, apart from Hungary.

Shrestha and Subedi (2015) examined determinants of stock market performance in Nepal. The study used the multiple linear regression model to analyse data. The study findings established that stock market performance responded absolutely to price rises and growth in money, and depressingly to rate of interest. In addition, the study established that accessibility of liquidity and low rates of interest inspire stock market performance.

Amarasinghe (2015) in the study, active association involving interest rates and stock price: Empirical Evidence from Colombo Stock Exchange utilized monthly data for a seven year period spanning 2007 – 2013 using all share price index data and interest rates. Granger Causality tests and regression analysis were conducted on the data after stationary tests

using Augmented Dickey Fuller Tests. The study found that a significant correlation is present between interest rates and stock exchange prices. A depressing affiliation was there between the two variables in Colombo stock exchange. As the interest rates rose, the stock prices and returns declined. The context of this study was different from the current study.

#### **2.4.2 Local Studies**

Kiseu (2017) conducted a study on the influence of interest rate capping on the amount of credit given by Kenyan commercial banks. The study period covered three quarters before and after the capping law came into effect. Descriptive and inferential statistics was employed in the study. The findings were that the interest rate control did not significantly affect how the commercial banks issued their loans. Although the study did find that some banks contracted their loans books after the law came into effect, such were not enough to shift the ground for the whole industry. However, it was also found that the growth of the credit wasn't drastic as the policy makers would have expected and only grew by 0.2% compared to pre-capping period.

Murimi (2017) conducted a study on the influence the interest rate capping has on retail credit growth of commercial banks. The population of the study was the 43 Kenyan banks. A bivariate regression analysis was used to establish the link between retail credit growth and capping of interest rates. The findings of the study indicate that interest rate charged by commercial banks significantly affects credit growth.

Othigo (2017) carried out a study on the influence the interest rate capping announcement has on the stock returns of listed commercial banks in Kenya. The researcher utilized an event study methodology with an event window of 40 days and an estimation period of 30

days. Data was collected from NSE and NSE25 index was used as the benchmark for market prices. Using the market model ordinary least square regression and a 95% significance level, it was established that all financial institutions underperformed the market by registering negative CARs apart from KCB and Standard Chartered which exhibited negative CARs on the first day post the event. It was therefore concluded that interest rate capping has a significant negative effect on share returns.

Mbua (2017) investigate the effects of the recent capping of interest rates by the CBK on the listed bank's shares at the NSE of Kenya. The study adopted an observational research design and checklists were used for data collection. The correlations between the various variables were established using inferential statistics. The study established that a negative correlation exists between lending rates and stock prices in third and fourth quarter of 2015 and a positive one between lending rates and stock prices in third and fourth quarter of 2016. Upon effecting interest rate cap, the banks' share prices significantly dropped and this shows that interest rates significantly influence the decision on whether to invest in bank shares or not.

Kimunge (2017) conducted a study to establish the influence the interest rate capping has on stock returns at the NSE. The study was an event analysis of the coming to law of Interest Rate Capping law on 14<sup>th</sup> September 2016. The study analyzed the reaction of stock returns of 11 listed commercial banks 30 days before the law came to action and 30 days after the law came to action. T-test was carried out to establish the significance of interest rate capping on stock returns. The study found out that only 18.18% (Kenya Commercial Bank and CFC Bank) reacted negatively to the interest rate capping. All the other (81.82%) banks reacted positively. Further, the study found out 7 (63.64%)

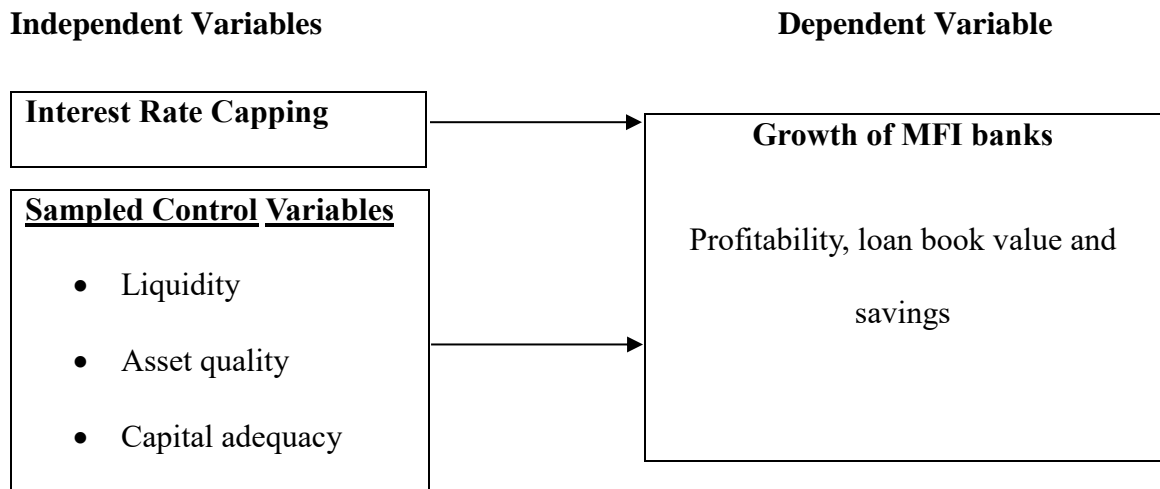


commercial banks recorded negative abnormal returns while 4 (36.36%) commercial banks recorded positive abnormal returns in reaction to the interest rate capping law. However, none of the abnormal returns were found to be statistically significant.

## 2.5 Conceptual Framework

The conceptual framework is a diagrammatic representation of how the factors identified are related to each other. The elements given consideration here are interest rate capping and growth of microfinance banks. The independent variable is interest rate capping while growth of microfinance banks is the dependent variable which the study seeks to explain. The control variables characterized here are liquidity, asset quality and capital adequacy.

**Figure 2.1: Conceptual Model**



**Source: Researcher (2018)**

## 2.6 Summary of the Literature Review

A number of theoretical frameworks have explained theoretically expected relationship between interest rate capping and the growth of firms. The theories discussed here are; efficient market hypothesis, modern portfolio theory and rational expectations theory. Some key influencers of firm growth have been discussed in this section also. Globally and

locally, there are many empirical studies that have been done on interest rates and influence of interest rate capping on performance of various sectors. This chapter has also discussed their outcomes. There has been lack of consensus among the various scholars on the impact of interest rate capping on growth of microfinance banks. In addition, the studies conducted locally have concentrated on banks leaving a gap in the microfinance sector. The study sought to answer the research question; what is the effect of interest rates capping on growth of microfinance banks in Kenya?

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

To establish the impact the interest rate capping has on growth of Kenyan microfinance banks, a research methodology was necessary to outline how the research is carried out. This chapter has four sections namely; research design, data collection, and diagnostic tests and analysis of data.

#### **3.2 Research Design**

The current study used a descriptive research design to investigate the effect of interest rate capping on growth of Kenya's microfinance banks. Descriptive design was utilized as the researcher is interested in finding out the state of affairs as they exist (Khan, 2008). This research design is appropriate for the study as the researcher is familiar with the phenomenon under investigation but want to know more regarding the nature of associations between the variables of the study. In addition, a descriptive research aims at providing a valid and accurate representation of the study variables and this helps in responding to the research question (Cooper & Schindler, 2008).

#### **3.3 Population**

According to Burns and Burns (2008), population refers to the characters of interest upon which the study seeks to draw deductions. The population for this study included 11 Microfinance banks that were in operation during the study period (See Appendix I).

#### **3.4 Data Collection**

Data was exclusively collected from a secondary source. The secondary data were obtained

from the microfinance banks financial reports and from the Central Bank of Kenya as it is a required for the microfinance banks to submit their reports to the regulator. The data obtained covered ten quarters, five quarters before the introduction of interest rate capping in August 2016 (April 2015 to June 2016) and five quarters after introduction of interest rate capping (October 2016 to December 2017). The specific data collected were; loan book value, deposits, liquid assets, current liabilities, risk weighted assets, capital, book value of total liabilities and non-performing loans.

### **3.5 Data Analysis**

The data collected from the microfinance quarterly financial reports were organized in a manner that can help address the research objective. SPSS was applied in analyzing data. Both descriptive and regression analyses were carried out. In descriptive statistics, average was computed for each variable. In inferential statistics, both regression and correlation analysis were conducted. Correlation analysis involved determining the extent of relationship between the study variables while regression analysis involved establishing the cause and effect between the independent and dependent variables. The study used multivariate regression analysis to determine the relationship between the dependent variable (growth of microfinance banks) and independent variables: Capital adequacy, liquidity, loan quality and interest rate capping which was represented by a dummy.

#### **3.5.1 Analytical Model**

There are other explanatory variables other than interest rate capping that might perform a vital function in determining growth of microfinance banks in Kenya. The study estimated the following multiple regression model to establish the influence of these factors on the growth of microfinance banks. This helped to control for the effect of these factors. The

regression analysis was done thrice; the first regression had loan book value as the dependent variable, the second had customer deposits while the third regression had customer deposits as the dependent variable. The following model was used;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + d1 + \epsilon$$

**Where:**

Y is growth of a microfinance bank as measured in three ways; i) by the percentage change in the loan book value of each microfinance on a quarterly basis, ii) the percentage change in customer deposits (savings) of each microfinance bank on a quarterly basis and iii) profitability as measured by return on equity on a quarterly basis

$\beta_0$  is the regression constant (parameter of the function)

$\beta_1$ ,  $\beta_2$  and  $\beta_3$  are the coefficients of independent variables

$X_1$  is microfinance liquidity as measured by change in current ratio defined by Central bank as; liquid assets divided by deposit liabilities, matured and short term liabilities on a quarterly basis

$X_2$  is capital adequacy of a microfinance bank as measured by change in the ratio of core capital to total capital deposits on a quarterly basis

$X_3$  is the asset quality of a microfinance bank as measured by the change in total value of nonperforming loans divided by total gross loans and advances per quarter.

d1 Interest rate capping dummy which takes the value of zero (0) in the 5 quarters before interest rate capping, that is between April 2015 and June 2016 and the value of 1 in the 5 quarters after interest rate capping that is between October 2016 and December

2017. Since there are 11 microfinance banks, there were 55 data points before interest rate capping and 55 data points after interest rate capping which were considered sufficient to carry out regression analysis. The regression analysis enabled the researcher to determine whether interest rate capping has a significant influence on both the loan book values, the customer deposits and the profitability.

$\epsilon$  the error term

### **3.5.2 Tests of Significance**

Parametric tests i.e. F-test in Analysis of Variance (ANOVA) and t-test were used in measuring statistical significance in the difference of mean ratios. The F- test and the t – test were applied at 95% confidence level. The F statistic was used in establishing a statistical significance of regression equation whereas the t statistic was used in testing statistical significance of study coefficients.

## CHAPTER FOUR

### DATA ANALYSIS, FINDINGS AND INTERPRETATION

#### 4.1 Introduction

This section represents study's findings established on the objectives of research. This chapter focused on collected data analysis from financial reports of microfinance banks to determine the impact of interest rate capping on growth of microfinance banks. Using descriptive statistics, correlation analysis and regression analysis, the results of the study were presented in form of tables for easy interpretation.

#### 4.2 Diagnostic Tests

The researcher carried out diagnostic tests on the collected data. A test of Multicollinearity was undertaken. VIF value was useful where values less than 10 for VIF implies that there is no multicollinearity. For multiple regressions to be applicable there shouldn't be strong connection among variables. VIF Statistics was used in measuring multicollinearity. Based on the results, all the variables VIF values are <10 as shown in Table 4.1 revealing that statistically significant multicollinearity doesn't exist among the independent variables (Leverage, Management efficiency, bank size and asset quality).

**Table 4.1: Multicollinearity Test**

Variable	VIF	1/VIF
Interest rate capping	2.05	0.487792
Liquidity	1.48	0.677366
Capital adequacy	1.33	0.750329
Asset quality	1.26	0.795979
Mean VIF	1.53	

**Source: Research Findings (2018)**

Shapiro-walk test and Kolmogorov-Smirnov test was used in normality test. The null hypothesis for the test was that the secondary data was not normal. If the p-value recorded was more than 0.05, the researcher would reject it. The test findings are as illustrated in table 4.2.

**Table 4.2: Normality Test**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Interest rate capping	.149	110	.300	.857	110	.853
Asset quality	.156	110	.300	.906	110	.822
Firm Liquidity	.172	110	.300	.869	110	.723
Capital adequacy	.165	110	.300	.880	110	.784
a. Lilliefors Significance Correction						

**Source: Research Findings (2018)**

Both Kolmogorov-Smirnova and Shapiro-Wilk tests recorded o-values greater than 0.05 implying that the data used in research was distributed normally and therefore the null hypothesis was rejected. This data was therefore appropriate for use to conduct parametric tests such as Pearson’s correlation, regression analysis and analysis of variance.

Autocorrelation tests were executed so as to check for correlation of error terms across time periods. Autocorrelation was tested using the Durbin Watson test. A durbin-watson statistics of 1.690, 1.546 and 1.747 indicated that the variable residuals were not serially correlated since the values were within the acceptable range of between 1.5 and 2.5.



**Table 4.3: Autocorrelation Test for Model I**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.672 <sup>a</sup>	.452	.431	1.3708328	1.690

a. Predictors: (Constant), Interest rate capping, Liquidity, Asset quality, Capital adequacy

b. Dependent Variable: Profitability

**Source: Research Findings (2018)**

**Table 4.4: Autocorrelation Test for Model II**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.575 <sup>a</sup>	.331	.306	.4141255	1.546

a. Predictors: (Constant), Interest rate capping, Liquidity, Asset quality, Capital adequacy

b. Dependent Variable: Customer deposits

**Source: Research Findings (2018)**

**Table 4.5: Autocorrelation Test for Model III**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.619 <sup>a</sup>	.383	.360	.4085541	1.747

a. Predictors: (Constant), Interest rate capping, Liquidity, Asset quality, Capital adequacy

b. Dependent Variable: Loan book value

**Source: Research Findings (2018)**

### 4.3 Descriptive Analysis

Descriptive statistics gives a presentation of the mean, maximum and minimum values of variables applied together with their standard deviations in this study. Table 4.6 below shows the descriptive statistics for the variables applied for the research. All variables were analyzed using SPSS software for the period of 10 quarters (April 2015 to December 2017) on a quarterly basis. Profitability had 0.16 as mean with a 0.8174 standard deviation. Loan

book value resulted to 7.589 mean with a 0.5106 standard deviation. Liquidity had a 0.3893 mean and 0.1703 standard deviation. Capital adequacy resulted to 0.8080 mean with a 0.8697 standard deviation. Asset quality had a mean of 0.8427 and a standard deviation of 0.0325 while customer deposits recorded a 7.7814 mean with a 0.4970 standard deviation.

**Table 4.6: Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
Profitability	110	-.1400	.8900	.159991	.8173547
Customer deposits	110	7.0081	8.5849	7.781438	.4970025
Loan book value	110	6.2291	8.6090	7.588964	.5105530
Liquidity	110	.10810	.80790	.3893118	.17033467
Asset quality	110	.0052	.3860	.126481	.1027828
Capital adequacy	110	.7727	.9222	.842741	.0324641
Interest rate capping	110	0	1	.52	.502
Valid N (listwise)	110				

**Source: Research Findings (2018)**

#### 4.4 Correlation Analysis

Correlation analysis are used to test whether a relationship exists between two variables and often range between (-) strong negative correlation and (+) perfect positive correlation. The study employed the Pearson correlation to analyze the level of correlation between the growth of microfinance banks and the independent variables for this study (interest rate capping, capital adequacy, asset quality and liquidity).

The study found out that there was a negative and statistically significant correlation ( $r = -.589$ ,  $p = .000$ ) between asset quality and profitability of microfinance banks. The study further established that a positive and significant correlation exists between liquidity and profitability of microfinance banks as evidenced by ( $r = .437$ ,  $p = .000$ ). Capital adequacy was found to have a weak positive but significant association with profitability as

evidenced by ( $r = .477, p = .000$ ). Interest rate capping was found to have an insignificant correlation with profitability as evidenced by ( $r = .106, p = .271$ ).

The study further found out that there was a negative and statistically significant correlation ( $r = -.546, p = .000$ ) between asset quality and customer deposits of Kenyan microfinance banks. The study further established that a positive and insignificant correlation exists between liquidity and customer deposits of microfinance banks as evidenced by ( $r = .127, p = .188$ ). Capital adequacy was found to have a weak negative but insignificant association with customer deposits as evidenced by ( $r = -.116, p = .227$ ). Interest rate capping was found to have an insignificant correlation with customer deposits as evidenced by ( $r = .037, p = .703$ ).

In addition, the study further found out that there was a positive but statistically insignificant correlation ( $r = .059, p = .543$ ) between asset quality and loan book value of Kenyan microfinance banks. The study further established that a negative and significant correlation exists between liquidity and loan book value of microfinance banks as evidenced by ( $r = -.520, p = .000$ ). Capital adequacy was found to have a weak negative but insignificant association with loan book value as evidenced by ( $r = -.066, p = .496$ ). Interest rate capping was found to have an insignificant correlation with loan book value as evidenced by ( $r = .063, p = .510$ ).

**Table 4.7: Correlation Analysis**

		Profitability	Customer deposits	Loan book value	Asset quality	Liquidity	Capital adequacy	Interest rate capping
Profitability	Pearson Correlation	1	.536**	.099	-.589**	.437**	.477**	.106
	Sig. (2-tailed)		.000	.304	.000	.000	.000	.271
	N	110	110	110	110	110	110	110
Customer deposits	Pearson Correlation	.536**	1	-.141	-.546**	.127	-.116	.037
	Sig. (2-tailed)	.000		.143	.000	.188	.227	.703
	N	110	110	110	110	110	110	110
Loan book value	Pearson Correlation	.099	-.141	1	.059	-.520**	-.066	.063
	Sig. (2-tailed)	.304	.143		.543	.000	.496	.510
	N	110	110	110	110	110	110	110
Asset quality	Pearson Correlation	-.589**	-.546**	.059	1	.350**	.440**	.104
	Sig. (2-tailed)	.000	.000	.543		.000	.000	.278
	N	110	110	110	110	110	110	110
Liquidity	Pearson Correlation	.437**	.127	-.520**	.350**	1	.543**	.064
	Sig. (2-tailed)	.000	.188	.000	.000		.000	.508
	N	110	110	110	110	110	110	110
Capital adequacy	Pearson Correlation	.477**	-.116	-.066	.440**	.543**	1	-.082
	Sig. (2-tailed)	.000	.227	.496	.000	.000		.394
	N	110	110	110	110	110	110	110
Interest rate capping	Pearson Correlation	.106	.037	.063	.104	.064	-.082	1
	Sig. (2-tailed)	.271	.703	.510	.278	.508	.394	
	N	110	110	110	110	110	110	110

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Source: Research Findings (2018)**

## 4.6 Regression Analysis

This research study had three measures of the dependent variable and so the researcher ran three regression models. The findings of the three models are discussed in this section.

### 4.5.1 Profitability Regression Results

Profitability of microfinance banks was regressed against four predictor variables; interest rate capping, capital adequacy, asset quality and liquidity. The regression analysis was executed at 5% significance level. The study obtained the model summary statistics as illustrated in table 4.8 below.

**Table 4.8: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.672 <sup>a</sup>	.452	.431	1.3708328	1.690

a. Predictors: (Constant), Interest rate capping, Liquidity, Asset quality, Capital adequacy

b. Dependent Variable: Profitability

#### **Source: Research Findings (2018)**

R squared is the coefficient of determination and depicts the variations in the response variable that is brought about by the changes in the predictor variables. From the outcome in table 4.8 above, the value of R square was 0.452, a discovery that 45.2 percent of the deviations in profitability of microfinance banks are caused by changes in interest rate capping, capital adequacy, asset quality and liquidity of the firms. Other variables not included in the model justify for 54.8 percent of the variations in profitability of microfinance banks. Also, the results revealed that there exists a strong relationship among the selected independent variables and the profitability of microfinance banks as shown by the correlation coefficient (R) equal to 0.672.

**Table 4.9: Analysis of Variance**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	162.689	4	40.672	21.644	.000 <sup>b</sup>
	Residual	197.314	105	1.879		
	Total	360.003	109			

a. Dependent Variable: Profitability

b. Predictors: (Constant), Interest rate capping, Liquidity, Asset quality, Capital adequacy

**Source: Research findings (2018)**

The significance value is 0.000 which is less than  $p=0.05$ . This implies that the model was statistically significant in predicting how interest rate capping, capital adequacy, asset quality and liquidity affect profitability of microfinance banks in Kenya.

The researcher used t-test to determine the significance of each individual variable used in this study as a predictor of profitability of microfinance banks in Kenya. The p-value under sig. column was used as an indicator of the significance of the association between the dependent and the independent variables. At 95% level of confidence, a p-value of less than 0.05 was interpreted as a statistical significance measure. As such, a p-value above 0.05 shows that a statistically insignificant association between the dependent and the independent variables. The findings are as presented in table 4.10

**Table 4.10: Model Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	10.303	4.157		2.478	.015
Asset quality	-8.306	1.453	-.470	-5.717	.000
Liquidity	2.162	.934	.203	2.316	.022
Capital adequacy	.238	5.162	.147	1.596	.114
Interest rate capping	.564	.267	.156	2.108	.037

a. Dependent Variable: Profitability

Source: Research Findings (2018)

From the above results, it is evident that liquidity produced positive and statistically significant values for this study (high t-value (2.316),  $p < 0.05$ ). Asset quality produced negative and statistically significant value for this study as shown by a p value that is less than 5%. Interest rate capping and capital adequacy produced positive but insignificant values for this study as shown by high p values. Thus, a conclusion can be made that liquidity has a significant positive effect on profitability of microfinance banks while asset quality has a significant negative effect. Interest rate capping and capital adequacy are insignificant determiners of microfinance banks profitability.

#### 4.5.2 Customer Deposit Regression Results

Customer deposits of microfinance banks were regressed against four predictor variables; interest rate capping, capital adequacy, asset quality and liquidity. The regression analysis was executed at 5% significance level. The study obtained the model summary statistics as illustrated in table 4.11 below.

**Table 4.11: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.575 <sup>a</sup>	.331	.306	.4141255	1.546

a. Predictors: (Constant), Interest rate capping, Liquidity, Asset quality, Capital adequacy

b. Dependent Variable: Customer deposits

**Source: Research Findings (2018)**

R squared is the coefficient of determination and depicts the variations in the response variable that is brought about by the changes in the predictor variables. From the outcome in table 4.11 above, the value of R square was 0.331, a discovery that 33.1 percent of the deviations in customer deposits of microfinance banks are caused by changes in interest rate capping, capital adequacy, asset quality and liquidity of the firms. Other variables not included in the model justify for 66.9 percent of the variations in customer deposits of microfinance banks in Kenya. Also, the results revealed that there exists a strong relationship among the selected independent variables and the customer deposits of microfinance banks as shown by the correlation coefficient (R) equal to 0.575.

**Table 4.12: Analysis of Variance**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	8.917	4	2.229	12.998	.000 <sup>b</sup>
	Residual	18.007	105	.171		
	Total	26.924	109			

a. Dependent Variable: Customer deposits

b. Predictors: (Constant), Interest rate capping, Liquidity, Asset quality, Capital adequacy

**Source: Research findings (2018)**



The significance value is 0.000 which is less than  $p=0.05$ . This implies that the model was statistically significant in predicting how interest rate capping, capital adequacy, asset quality and liquidity affect customer deposits of microfinance banks in Kenya.

The researcher used t-test to determine the significance of each individual variable used in this study as a predictor of customer deposits of microfinance banks in Kenya. The p-value under sig. column was used as an indicator of the significance of the association between the dependent and the independent variables. At 95% level of confidence, a p-value of less than 0.05 was interpreted as a statistical significance measure. As such, a p-value above 0.05 shows that a statistically insignificant association between the dependent and the independent variables. The findings are as indicated in table 4.13

**Table 4.13: Model Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	5.828	1.256		4.641	.000
1 Asset quality	-3.065	.439	-.634	-6.983	.000
Liquidity	.026	.282	.009	.093	.926
Capital adequacy	2.718	1.560	.178	1.743	.084
Interest rate capping	.117	.081	.118	1.446	.151

a. Dependent Variable: Customer deposits

**Source: Research Findings (2018)**

From the above results, it is evident that asset quality produced negative and statistically significant values for this study (high t-value (-6.983),  $p < 0.05$ ). Liquidity, capital adequacy and interest rate capping produced positive but statistically significant values for this study as indicated by p values that were more than 0.05. It can thus be concluded that asset quality has a significant negative effect on customer deposits of microfinance banks.

Interest rate capping, liquidity and capital adequacy are insignificant determiners of microfinance banks customer deposits.

#### 4.5.1 Loan Book Value Regression Results

Loan book value of microfinance banks was regressed against four predictor variables; interest rate capping, capital adequacy, asset quality and liquidity. The regression analysis was executed at 5% significance level. The study obtained the model summary statistics as illustrated in table 4.14 below.

**Table 4.14: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.619 <sup>a</sup>	.383	.360	.4085541	1.747

a. Predictors: (Constant), Interest rate capping, Liquidity, Asset quality, Capital adequacy

b. Dependent Variable: Loan book value

**Source: Research Findings (2018)**

R squared is the coefficient of determination and depicts the variations in the response variable that is brought about by the changes in the predictor variables. From the outcome in table 4.14 above, the value of R square was 0.383, a discovery that 38.3 percent of the deviations in loan book value of microfinance banks are caused by changes in interest rate capping, capital adequacy, asset quality and liquidity of the firms. Other variables not included in the model justify for 61.7 percent of the variations in loan book value of Kenyan microfinance banks. Also, the results revealed that there exists a strong relationship among the selected independent variables and the loan book value of microfinance banks as shown by the correlation coefficient (R) equal to 0.619.

**Table 4.15: Analysis of Variance**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	10.886	4	2.722	16.305	.000 <sup>b</sup>
	Residual	17.526	105	.167		
	Total	28.412	109			

a. Dependent Variable: Loan book value

b. Predictors: (Constant), Interest rate capping, Liquidity, Asset quality, Capital adequacy

**Source: Research findings (2018)**

The significance value is 0.000 which is less than  $p=0.05$ . This implies that the model was statistically significant in predicting how interest rate capping, capital adequacy, asset quality and liquidity affect loan book value of microfinance banks in Kenya.

The researcher used t-test to determine the significance of each individual variable used in this study as a predictor of loan book value of microfinance banks in Kenya. The p-value under sig. column was used as an indicator of the significance of the association between the dependent and the independent variables. At 95% level of confidence, a p-value of less than 0.05 was interpreted as a statistical significance measure. As such, a p-value above 0.05 shows that a statistically insignificant association between the dependent and the independent variables. The findings are as indicated in table 4.16

**Table 4.16: Model Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	4.839	1.239		3.906	.000
Asset quality	.942	.433	.190	2.176	.032
Liquidity	-2.200	.278	-.734	-7.909	.000
Capital adequacy	4.068	1.539	.259	2.644	.009
Interest rate capping	.114	.080	.112	1.426	.157

a. Dependent Variable: Loan book value

**Source: Research Findings (2018)**

From the above results, it is evident that liquidity produced negative and statistically significant values for this study (high t-value (-7.909),  $p < 0.05$ ). Asset quality and capital adequacy produced negative and statistically significant value for this study as shown by p values that were less than 5%. Interest rate capping produced positive but insignificant values for this study as shown by a high p value. It can thus be concluded that liquidity has a significant negative effect on loan book value of microfinance banks while asset quality and capital adequacy has a significant positive effect. Interest rate capping is an insignificant determiner of microfinance banks loan book value.

#### **4.7 Interpretation of Findings and Discussions**

The research purposed to explore the influence of interest rate capping on growth of microfinance banks. Interest rate capping as measured by a dummy, asset quality as measured by the ratio of non-performing loans to total gross loans, liquidity as determined by the ratio of liquid assets to short term liabilities and capital adequacy as measured by the ratio of core capital to total capital deposits were the independent variables while growth of microfinance banks as measured by profitability, loan book value and customer

deposits was the dependent variable. The impact of each of the independent variable on the dependent variable was analyzed in terms of strength and direction.

The Pearson correlation coefficients between the variables revealed that there is a negative and statistically significant correlation between asset quality and profitability of Kenyan microfinance banks. The study further established that a positive and significant correlation exists between liquidity and profitability of microfinance banks. Capital adequacy was found to have a weak positive but significant association with profitability. The study further found out that there was a negative and statistically significant correlation between asset quality and customer deposits of microfinance banks in Kenya. In addition, the study further established that a negative and significant correlation exists between liquidity and loan book value of microfinance banks.

The profitability model summary revealed that the independent variables: interest rate capping, capital adequacy, asset quality and liquidity explains 45.2% of variation in the dependent variable as depicted by an  $R^2$  value implying that other factors were not included in the model that account for 54.8% of changes in profitability of microfinance banks in Kenya. The model is fit at 95% confidence level as the F-value was 21.644. Therefore, the profitability multiple regression model is statistically significant and suitable in predicting how the independent variables selected affects profitability of microfinance banks.

The customer deposit model summary revealed that the independent variables: interest rate capping, capital adequacy, asset quality and liquidity explains 33.1% of variation in the dependent variable as depicted by an  $R^2$  value implying that other factors were not included in the model that account for 66.9% of changes in customer deposits of microfinance banks

in Kenya. The model is fit at 95% confidence level as the F-value was 12.998. Therefore, the customer deposit multiple regression model is statistically significant and suitable in predicting how the independent variables selected affects customer deposits of microfinance banks.

The loan book value model summary revealed that the independent variables: interest rate capping, capital adequacy, asset quality and liquidity explains 38.3% of variation in the dependent variable as depicted by an  $R^2$  value implying that other factors were not included in the model that account for 61.7% of changes in loan book value of microfinance banks in Kenya. The model is fit at 95% confidence level as the F-value was 16.305. Therefore, the loan book value multiple regression model is statistically significant and suitable in predicting how the independent variables selected affects loan book value of microfinance banks.

The findings of this study are in line with Kiseu (2017) who conducted a study on the impacts of interest rate capping on the amount of credit given by Kenyan commercial banks. The study period covered three quarters before and after the capping law came into effect. Descriptive and inferential statistics was employed in the study. The findings were that the interest rate control did not significantly affect how the commercial banks issued their loans. Although the study did find that some banks contracted their loans books after the law came into effect, such were not enough to shift the ground for the whole industry. However, it was also found that the growth of the credit was not drastic as the policy makers would have projected and only grew by 0.2% more compared to pre-capping period.

This study disagrees with Murimi (2017) who conducted a study on the effect of interest

rate capping on retail credit growth on Kenya commercial banks. The population of the study was all the 43 Kenyan banks. A bivariate regression analysis was used to establish the link between retail credit growth and capping of interest rates. The findings of the study indicate that interest rate charged by commercial banks significantly affects credit growth. Introduction of interest rate capping interferes with the market and hinders financial institutions from offering loan products to the ones at the lower end of the market.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

This section summarizes previous chapter's findings, conclusion and study limitations. It also elucidates the policy recommendations that policy makers can implement to achieve the expected growth of microfinance banks in Kenya. Moreover, suggestions for further research necessary for future studies are outlined.

#### **5.2 Summary of Findings**

The researcher aimed at investigating effect of interest rate capping on microfinance banks' growth in Kenya. Independent variables for the study were interest rate capping, asset quality, capital adequacy and liquidity. The study adopted a descriptive cross-sectional research design. Quarterly financial reports were used to retrieve secondary data which were analyzed using SPSS software version 22. The study used quarterly data for the 11 microfinance banks covering five quarters before interest rate capping and five quarters after interest rate capping.

From the results of correlation matrix, a statistically significant but negative correlation exists between asset quality and profitability of Kenyan microfinance banks. It was further established that a significant and a positive correlation exists between liquidity and profitability of microfinance banks. Capital adequacy was found to have a weak positive but significant association with profitability. The study further found out that there was a negative and statistically significant correlation between asset quality and customer deposits of microfinance banks in Kenya. In addition, the study further established that a



negative and significant correlation exists between liquidity and loan book value of microfinance banks.

Under the profitability regression model, the co-efficient of determination R-square value was 0.452 implying that the predictor variables selected for this study explains 45.2% of variation in the dependent variable as depicted by an  $R^2$  value implying that other factors were not included in the model that account for 54.8% of changes in profitability of microfinance banks in Kenya. The model is fit at 95% confidence level as the F-value was 21.644. Therefore, the profitability multiple regression model is statistically significant and suitable in predicting the influence of independent variables on profitability of microfinance banks.

The co-efficient of determination R-square value under the customer deposit regression model was 0.331 implying that the predictor variables selected for this study explains 33.1% of variation in the dependent variable as depicted by an  $R^2$  value implying that other factors were not included in the model that account for 66.9% of changes in customer deposits of microfinance banks in Kenya. The model is fit at 95% confidence level as the F-value was 12.998. Therefore, the customer deposit regression model is statistically significant and suitable in predicting how the independent variables selected affects customer deposits of microfinance banks.

The co-efficient of determination R-square value under the loan book value regression model was 0.383 implying that the predictor variables selected for this study explains 38.3% of variation in the dependent variable as depicted by an  $R^2$  value implying that other factors were not included in the model that account for 61.7% of changes in loan book

value of microfinance banks in Kenya. The model is fit at 95% confidence level as the F-value was 16.305. Therefore, the loan book value multiple regression model is statistically significant and suitable in predicting how the independent variables selected affects loan book value of microfinance banks.

### **5.3 Conclusion**

From the study findings, it can be concluded from the study that the profitability, loan book value and customer deposits of microfinance banks in Kenya are significantly affected by interest rate capping, capital adequacy, asset quality and liquidity. Asset quality had a negative and significant effect on profitability of microfinance banks and this implies that an increase in the value of non-performing loans will significantly cause a decrease in profitability of microfinance banks in Kenya.

The study established that liquidity had a positive and significant impact on profitability of microfinance banks and therefore it is concluded that higher levels of liquidity leads to an increase in profitability. Asset quality was found to be a statistically significant determiner of microfinance banks customer deposits and this means that an increase in the level of non-performing loans significantly reduces the value of customer deposits.

Asset quality was found to have a significant positive effect on loan book value of microfinance banks and this implies that banks that have a high level of non-performing loans are likely to have a high level of loan book value. Liquidity was found to have a significant negative effect on loan book value and this implies that an increase in microfinance liquidity will significantly reduce microfinance loan book value. Capital adequacy was found to have a significant positive effect on loan book value and this implies

that an increase in a microfinance bank's capital adequacy will significantly lead to an increase in loan book value.

This finding concurs with Kiseu (2017) who conducted a study in Kenya on the influence interest rate capping has on the amount of credit issued by commercial banks. The study period covered three quarters before and after the capping law came into effect. Descriptive and inferential statistics was employed in the study. The findings were that the interest rate control did not significantly affect how the commercial banks issued their loans. Although the study did find that some banks contracted their loans books after the law came into effect, such were not enough to shift the ground for the whole industry. However, it was also found that the growth of the credit was not drastic as the policy makers would have projected and only grew by 0.2% more as compared to pre-capping period.

#### **5.4 Limitations of the Study**

The scope of this study was for 10 quarters 2015-2017. It has not been determined if the results would hold for a longer study period. Furthermore it is uncertain whether similar findings would result beyond 2017. A longer study period is more reliable as it will take into account major happenings not accounted for in this study.

One of the study's limitations of was the quality of the data. It is difficult to derive conclusions from the study since the legitimacy of the situation cannot be ascertained. The data that has been used is only assumed to be accurate. The measures used may keep on deviating from one year to another subject to prevailing condition. Secondary data that had already been retrieved was utilized for the study, unlike the primary data which is first-hand information. The study also considered selected determinants and not all the factors

affecting growth of microfinance banks in Kenya mainly due to limitation of data availability.

For data analysis purposes, the researcher applied a multiple linear regression model. Due to the shortcomings involved when using regression models such as erroneous and misleading results when the variable values change, the researcher cannot be able to generalize the findings with certainty. If more and more data is added to the functional regression model, the hypothesized relationship between two or more variables may not hold.

## **5.5 Recommendations**

### **5.5.1 Policy Recommendations**

Interest rate capping was found to have an insignificant effect on profitability, customer deposits and loan book value. This study recommends that when policy makers are considering repealing of interest rate capping due to its negative effect in the economy, profitability, customer deposits and loan book value of microfinance banks should not be a reason to repeal as they are not significantly affected by interest rate capping.

The study found out that a positive relationship exists between profitability and liquidity position of a microfinance bank. This study recommends that a comprehensive assessment of microfinance bank's immediate liquidity position should be undertaken to ensure the company is operating at sufficient levels of liquidity that will lead to improved profitability of the microfinance banks. This is because a firm's liquidity position is of high importance since it influences the firm's current operations.

The study established that there was a negative and significant influence of asset quality on profitability of microfinance banks. It's recommended that sufficient measures ought to be adopted by managers of these banks to raise their profitability by reducing the level of non-performing loans in their books. Microfinance banks and all banks in general should work on increasing their asset quality that will cause an increase in profits because this translates to improved shareholder wealth which is the main goal of a firm.

Micro finance banks ought to adhere to banking rules and regulations to prevent the many cases of nonperforming loans and the regulatory authorities should inspect, on regular bases, the way the banking industry lend. The credit policies ought to be integrated with the profitability objectives of the commercial banks and secure credit culture introduced.

#### **5.5.2 Suggestions for Further Research**

This study focused on interest rate capping and growth of microfinance banks and relied on secondary data. A research study where data collection relies on primary data i.e. in depth questionnaires and interviews covering all the 11 microfinance banks in Kenya is recommended so as to compliment this research.

The study was not exhaustive of the independent variables affecting growth of microfinance banks and this study recommends that further studies be carried out to incorporate other variables like management efficiency, growth opportunities, firm size, industry practices, age of the firm, political stability and other macro-economic variables. Establishing the impact of each variable on growth of microfinance banks in Kenya will enable policy makers know what tool to use when maximizing shareholder's wealth.

The study concentrated on the last 10 quarters since it was the most recent data available. Future studies may use a range of many years e.g. from 2000 to date and this can help confirm or disapprove the findings of this study. The study limited itself by focusing on listed microfinance Kenyan banks. It is recommended that further studies be conducted on other microfinance institutions operating in Kenya. Finally, due to the imperfections of regression models, other models such as the Vector Error Correction Model (VECM) can be used to explain the various relationships between the variables.

## REFERENCES

- Adjasi, C., & Biekpe, N. (2006). Interest rate and stock market returns in Africa, *African Finance Journal*, 8(2), 12-27.
- Aggrawal, G. (2010). A study of exchange rate movement and stock market volatility. *International Journal of Business Management*, 5(12), 67-73.
- Ali, A. (2014). Stock Markets, Corporate Finance, and Economic Growth: An Overview. *World Bank Economic Review*, 10, 223-239.
- Aligony, J. (2016 August 25). *Shares in Kenyan bank hit after interest rates cap move.* Financial Times
- Amarasinghe, A. (2015). Dynamic Relationship between Interest Rate and Stock Price: Empirical Evidence from Colombo Stock Exchange. *International Journal of Business and Social Science*, 6 (4), 92-97
- Asaolu, T. O. & Ogunmuyiwa, M.S. (2011). An econometric analysis of the impact of macroeconomic variables on stock market movement in Nigeria. *Asian Journal of Business Management*, 3 (1) 72-78.
- Asian Development Bank Institute. (2009). Efficiency of Commercial Banks in SubSaharan Africa: A Comparative Analysis of Domestic and Foreign Banks. *Economic Development in Africa*, 1(1), 24-31.
- Athanasoglou. P., Brissimis, S., & Delis, M, (2005). Bank-Specific, Industry-Specific and Macroeconomics Determents of Bank Profitability, *Bank of Greece*, No. 25.
- Baker, M., & Stein, J. C. (2004). Market liquidity as a sentiment indicator. *Journal of Financial Markets*, 7(3), 271-299
- Balparada, B., Caporale, G. M. & Gil-Alana, L. A. (2015). The Kenyan Stock Market: Inefficiency, Long Memory, Persistence and Anomalies in the NSE-20. *Working Paper No. 15-11. Economics and Finance Working Paper Series*

- Barnor, C. (2014). *The Effect of Macroeconomic Variables on Stock Market Returns in Ghana (2000-2013)*. Unpublished Dissertation. Walden University. Available at <http://scholarworks.waldenu.edu/dissertations>
- Bekaert, G. (1998). *Regime Switches in Interest Rates*. Cambridge, Mass.: National Bureau of Economic Research.
- Capera, L., Murcia, A. & Estrada, D. (2011). Efectos de los Límites a las Tasas de Interés sobre la Profundización Financiera. *Financial Stability Report*. Bogotá: Central Bank of Colombia
- Central Bank of Kenya (2017). *Annual Reports*, Central Bank of Kenya, Nairobi.
- Chandra, R. (2008). *Investment Analysis 3/E*. New York, NY: Tata McGraw-Hill Education.
- Chovancova, B. (2001). *Effect of Interest Rates Movement on the Capital Markets of the developing Countries*. University of Economics in Bratislava
- Cooper, R., & Schindler, S. (2008). *Business research methods*. New York: Mc Grawhill
- Cuthbertson, K. (2004). *Quantity Financial Economics: Stocks, bonds and Foreign Exchange*. Chichester: Wiley, Corporation.
- Erdugan, R. (2012). *The Effect of Economic Factors on the Performance of the Australian Stock Market*. Unpublished Dissertation. Victoria University, Melbourne
- Fama, E. F. (1965). Behaviour of stock-market prices. *Journal of Business*, 38(1), 34-105.
- Fama, E. F. (1970). Efficient Capital Markets: A review of theory and empirical work. *Journal of Finance*, 25, 383-417
- Fama, E.F., Fisher, L., Jensen, M. & Roll, R. (1969). The adjustment of stock prices to new information. *International Economic Review*, 10, 1-21



- Ferrer, R., Bolos, V. J. & Benitez, R. (2014). *Interest Rate Changes and Stock Returns: A European Multi-Country Study With Wavelets*. Universidad de Valencia.
- Frenkel, J. A., & Razin, A. (2010). *Budget deficits and rates of interest in the world economy*. Cambridge, Mass.: National Bureau of Economic Research.
- Galindo, A., Fabio Schiantarelli, and Andrew Weiss. 2007. Does Financial Liberalization Improve Allocation of Investment? Micro-evidence from Developing Countries. *Journal of Development Economics*, 83 (2): 562–87.
- Gan, C., M. Lee, H. Y., & Zhang, J., (2006). Macroeconomic variables and stock market interactions: New Zealand evidence. *Int. Manage. Financial Innovation*, 3(4): 89-101
- Gazi, S., Uddin, W. & Mahmudul, A. (2009). Relationship between Interest Rate and Stock Price: Empirical Evidence from Developed and Developing Countries, *International Journal of Business and Management*, 4(3), 43-51
- Gupta, J. P., Chevalier, A., & Sayekt, F. (2008). *The Causality Between Interest Rate, Exchange Rate and Stock Price in Emerging Markets: The Case of the Jakarta Stock Exchange*. Independent Researchers.
- Hau, H. & Rey, H. (2002). Exchange Rates, Equity Prices and Capital Flows, *Journal of Empirical Finance*, 17(3), 44-59
- Howells, P. & Bain, K. (2017). *Financial Markets and Institutions* (9<sup>th</sup> ed.). Longman
- Humpe, A. & Macmillan, P. (2009). *Can macroeconomic variables explain long term stock movements? A Comparison of the US and Japan*. Working paper no, 17, Imprint.
- Kanwal, S & Nadeem, M. (2013). The Impact of Macroeconomic Variables on the Profitability of Listed Commercial Banks in Pakistan. *European Journal of Business and Social Sciences*, 2(9), 186-201

- Karolyi, G. A. (2001). Why Stock Return Volatility Really Matters, *Institutional Investor Journals Series*, 2(1), 1-16
- Kasman, S., Vardar, G., & Tunç, G. (2011). The impact of interest rate and exchange rate volatility on banks' stock returns and volatility: Evidence from Turkey. *Economic Modelling*, 28(3), 1328-1334
- Khan, J. A. (2008). *Research Methodology*. New Delhi. APH Publishing Corporation
- Khan, W. A., & Sattar, A. (2014). Impact of Interest Rate Changes on the Profitability of four Major Commercial Banks in Pakistan. *International Journal of Accounting and Financial Reporting*, 4(1), 142-147
- Kitatia, E., Evusa, Z. & Maithya, H. (2015). Effect of Macro-Economic Variables on Stock Market Prices for the Companies Quoted on the Nairobi Securities Exchange in Kenya. *International Journal of Sciences: Basic and Applied Research*, 21(2), 235- 263
- Maimbo, S. M., & Gallegos, C. A. (2014). Interest Rate Caps around the World: Still Popular, but a Blunt Instrument. *Policy Research Working Papers*. doi:10.1596/1813-9450-7070
- Maimbo, S. M., & Henriquez, G. C., (2014). *Interest rate caps around the world: Still popular, but a blunt instrument*. Washington, D.C.: World Bank.
- Malkiel, B. G., & Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The Journal of Finance*, 25(2), 383-417
- Maloba, I. (2016 September 28). *Impact of the capping of interest rates on the Kenyan economy*. Business Daily
- Markowitz, H.M. (1952): *Portfolio Selection*. New York: John Wiley and Sons.
- Masila, J., (2010). *Determinants of stock market development: The case for Nairobi securities exchange*. Unpublished MBA thesis. Nairobi: University of Nairobi.

- McKinnon, R. I. (1973). *Money and capital economic development*, Brookings Institution (Washington, D.C.)
- Mehwish, Z. (2013). Determinants of Stock Market Performance in Pakistan. *Interdisciplinary Journal of Contemporary Research in Business*, 4(5), 1017-18
- Mendelson, M., & Robbins, S. (2003). *Investment Analysis and Security Markets*. New York.
- Miller, H. (2013). *Interest Rate Caps and Their Impact on Financial Inclusion*. Economic and Private Sector, Professional Evidence and Applied Knowledge Services.
- Mishkin, F.S. & Eakins S. (2009). *Financial Markets and Institutions* (6<sup>th</sup> ed.). Pearson Prentice Hall.
- Mishkin, R. J. (2004). From efficient markets theory to behavioral finance. *The Journal of Economic Perspectives*, 17(1), 83-104.
- Murerwa, C. B. (2015). *Determinants of banks' financial performance in developing economies: evidence from kenyan commercial banks* (Doctoral dissertation, United States International University-Africa).
- Muriuki K., (2014). *The effect of inflation and interest rates on stock market returns of firms listed at the Nairobi securities exchange*. Unpublished master's thesis. University of Nairobi.
- Ngugi, E. N. (2014). *Effects of Lending Rates on Share Prices of Commercial Banks Quoted in the Nairobi Securities Exchange*. Unpublished MBA Project. University of Nairobi
- Nkwoma, I. J. (2014). Interest Rate deregulation, bank lending & deposits: An analysis of Nigerian Bank data. *African Journal of Business & Economic Research*, 9(1), 89- 117.

- Osamwonyi, I. O., & Evbayiro-Osagie, E. I. (2012). The relationship between macroeconomic variables and stock market index in Nigeria. *Journal of Economics*, 3(1), 55-63.
- Pal, K. & Mittal, R. (2011). Impact of Macroeconomic Indicators on Indian Capital Markets. *Journal of Risk Finance*, 12 (2): 84-97
- Ramsey, I. (2013). *To heap distress upon distress? comparative reflections on interest-rate ceilings*. The University of Toronto Law Journal, 60(2), 707-730. Retrieved from <http://www.jstor.org/stable/40801426>
- Sabri, N. R. (2008). *Financial Markets and Institutions in the Arab Economy*. Nova Science Publishers, NY.
- Saleem, F. Zafar, L. & Rafique, B. (2013). Long Run Relationship between Inflation and Stock Return: Evidence from Pakistan. *Social Sciences and Humanities*, 4 (2), 407 – 415
- San, O & Heng, T. (2013). Factors affecting the Profitability of Malaysian Commercial Banks. *African Journal of Business Management*, 7(8), 649-660
- Sariannidis, N., Giannarakis, G., & Litinas N (2010). The Effects of Macroeconomic Factors on the Sustainability, Large-Cap and Midcap Dow Jones Indexes. *Int. J. Bus. Policy Econ.*, 3(1): 21-36
- Shostak, F. (1997). In Defence of Fundamental Analysis: A critique of the efficient market hypothesis. *The Review of Austrian Economics Rev Austrian Econ*, 10(2), 12-19.
- Shrestha, P. K. &Subedi, B. R. (2015). Determinants of Stock Market Performance in Nepal. *NRB Economic Review*. NRB Working Paper series, NRB-WP-24
- Sireesha, P. B. (2013). Effect of Select Macro Economic Variables on Stock Returns in India. *International Journal of Marketing, Financial Services & Management Research*, 2 (6), 197-207

- Širucek, M. (2013). *The Impact of the Money Supply on Stock Prices and Stock Bubbles*. Mendel University
- Sloman, A.N & Kevin, J. (2007). *Economics for Business*. Prentice Hall, Financial Times.
- Solnik, B. (1987). Using financial prices to test exchange rate models. *Journal of Finance*, 1(1), 141-149.
- Subhani, M., Osman, R. & Gul, R. (2010). Do Interest Rate, Exchange Rate effect Stock Returns? A Pakistani Perspective.” *International Research Journal of Finance and Economics*, 50(4), 146-150
- Thang, F. Z. (2009). *Impact of interest rates and exchange rate on stock market index in malaysia*. Unpublished master’s thesis, University of Malaysia.
- Tobin, J. (1958). Liquidity preference as behavior towards risk, *The Review of Economic Studies*, 25, 65-86.
- Uddin, G. & Alam, A. (2009). Relationship between Interest Rate and Stock Price: Empirical Evidence from Developed and Developing Countries (2009). *International Journal of Business and Management* 4(3), 43-51
- Villegas, D. (1982). An Analysis of the Impact of Interest Rate Ceilings. *The Journal of Finance*, 37(4), 941-954
- Waqar, H. & Mustabsar, A. (2015). Behaviour of Macroeconomic Forces to Predict Stock Returns: Empirical Evidence from Global Financial Markets. *European Academic Research*, 3(3), 3674-3698
- Were, M. & Wambua, J. (2013). Assessing the determinants of interest rate spread of commercial banks in Kenya: An empirical investigation. KBA Centre for Research on Financial Markets and Policy Working Paper Series 01/13
- Wongbangpo, P. & Sharma S. (2002). Stock Market and Macroeconomic Fundamental Dynamic Interactions: ASEAN – 5 Countries. *Journal of Asian Economics*, 13(1), 27 – 51.

Yartey, C. A., & Adjasi, C. K. (2007). *Stock Market Development in Sub-Saharan Africa: Critical Issues and Challenges*. IMF Working Paper No. 07/209. IMF.

Yin, H. & Yang, J. (2013). Bank characteristics and stock reactions to federal funds rate target changes. *Applied Financial Economics*, 23(23), 1755-1764.

## **APPENDICES**

### **Appendix I: List of Microfinance Banks in Kenya**

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

**Source: CBK (2018)**

## Appendix II: Research Data

Company	Year	Quarter	Profitability	Asset quality	Liquidity	Customer deposits	Customer deposits	Loan book value	Loan book value	Capital adequacy	
Kenya Women Microfinance Bank	2015	Q2	0.0065	0.1003	0.4153	21,979,802	7.3420	164,321,967	8.2157	0.8769	
		Q3	0.0084	0.1247	0.4923	22,002,465	8.3424	166,004,397	8.2201	0.8753	
		Q4	0.0161	0.1805	0.5681	22,058,297	7.3436	190,947,903	8.2809	0.8714	
	2016	Q1	0.0051	0.1993	0.2748	21,727,353	7.3370	205,480,349	8.3128	0.8667	
		Q2	0.0063	0.2002	0.3370	24,039,489	7.3809	222,145,764	8.3466	0.8776	
		Q4	0.0099	0.1996	0.3652	22,422,351	7.3507	244,123,818	8.3876	0.8664	
	2017	Q1	0.0027	0.2134	0.3489	22,678,535	7.3556	248,863,252	8.3960	0.8657	
		Q2	0.0043	0.2392	0.3793	23,705,934	7.3749	258,159,603	8.4119	0.8694	
		Q3	0.0063	0.2525	0.5131	23,705,934	7.3749	262,459,764	8.4191	0.8678	
		Q4	0.0082	0.2298	0.4183	24,804,407	7.3945	267,985,238	8.4281	0.8726	
	Rafiki Microfinance Bank Ltd	2015	Q2	0.0005	0.0643	0.4358	62,469,210	7.7957	1,694,734	6.2291	0.8431
			Q3	0.0025	0.0790	0.4868	65,069,310	7.8134	1,855,248	6.2684	0.8502
Q4			-0.0207	0.2578	0.6845	69,280,267	7.8406	2,610,309	6.4167	0.8774	
2016		Q1	-0.0019	0.2351	0.4179	66,482,816	7.8227	48,824,374	7.6886	0.8735	
		Q2	0.0002	0.2815	0.4509	62,804,576	7.7980	55,142,958	7.7415	0.8654	
		Q4	-0.0003	0.1511	0.4038	55,995,671	7.7482	52,426,513	7.7196	0.8497	
2017		Q1	-0.0001	0.3313	0.5598	59,626,808	7.7754	51,356,798	7.7106	0.8583	
		Q2	0.0001	0.3521	0.5621	61,425,613	7.7883	46,581,940	7.6682	0.8637	
		Q3	0.0004	0.3765	0.5431	57,257,984	7.7578	47,123,839	7.6732	0.8529	
		Q4	0.0007	0.3860	0.5396	54,191,291	7.7339	47,908,081	7.6804	0.8437	
	2015	Q2	0.0240	0.0393	0.1210	64,198,677	7.8075	45,145,977	7.6546	0.8311	



Faulu Kenya Microfinance Bank		Q3	0.0288	0.0700	0.2022	65,245,206	7.8145	44,295,854	7.6464	0.8430
		Q4	0.0365	0.0762	0.1969	68,177,548	7.8336	53,455,760	7.7280	0.8347
	2016	Q1	0.0114	0.0734	0.1467	71,954,794	7.8571	318,183,426	8.5027	0.8354
		Q2	0.0241	0.0686	0.1338	78,391,648	7.8943	321,146,247	8.5067	0.8370
		Q4	0.0468	0.0932	0.1494	82,907,475	7.9186	341,329,318	8.5332	0.8284
	2017	Q1	0.0117	0.0971	0.1594	85,368,565	7.9313	347,559,906	8.5410	0.8252
		Q2	0.0294	0.0783	0.1306	88,413,486	7.9465	360,468,890	8.5569	0.8162
		Q3	0.0421	0.0693	0.1290	92,015,867	7.9639	379,748,996	8.5795	0.8186
Q4		0.0503	0.0526	0.1257	94,153,760	7.9738	387,459,312	8.5882	0.8191	
SMEP Microfinance Bank Ltd	2015	Q2	0.0182	0.0053	0.1291	38,899,261	7.5899	395,763,857	8.5974	0.8217
		Q3	0.0284	0.0052	0.1291	37,527,774	7.5744	402,756,982	8.6050	0.8166
		Q4	0.0349	0.0204	0.1426	42,162,947	7.6249	406,402,486	8.6090	0.8296
	2016	Q1	0.0127	0.0094	0.1081	41,427,446	7.6173	74,747,708	7.8736	0.8166
		Q2	0.0233	0.0228	0.1215	43,717,462	7.6407	80,554,920	7.9061	0.8066
		Q4	0.0457	0.0142	0.1205	47,815,075	7.6796	81,190,214	7.9095	0.8006
	2017	Q1	0.0123	0.0118	0.1143	49,736,103	7.6967	85,939,969	7.9342	0.7994
		Q2	0.0203	0.0249	0.1351	59,956,597	7.7778	80,104,753	7.9037	0.8172
Q3		0.0332	0.0310	0.1294	57,297,472	7.7581	69,432,374	7.8416	0.8094	
Q4		0.0472	0.0211	0.1206	56,630,656	7.7531	66,706,579	7.8242	0.7947	
Remu Microfinance Bank Ltd	2015	Q2	0.0274	0.0445	0.4949	234,699,871	8.3705	69,391,049	7.8413	0.8456
		Q3	0.0412	0.0502	0.5030	221,041,523	8.3445	71,479,580	7.8542	0.8333
		Q4	0.0501	0.0367	0.5064	241,152,697	8.3823	69,050,943	7.8392	0.8353
	2016	Q1	0.0126	0.0518	0.5312	241,913,140	8.3837	15,892,384	7.2012	0.8251
		Q2	0.0227	0.0572	0.5468	256,142,570	8.4085	15,726,633	7.1966	0.8473
		Q4	0.0274	0.0681	0.5612	259,498,223	8.4141	14,564,631	7.1633	0.8379

	2017	Q1	0.0091	0.0694	0.5648	260,429,453	8.4157	14,827,745	7.1711	0.8324	
		Q2	0.0184	0.0733	0.5639	268,015,547	8.4282	15,069,141	7.1781	0.8495	
		Q3	0.0294	0.0768	0.5627	269,481,764	8.4305	14,962,089	7.1750	0.8435	
		Q4	0.0368	0.0749	0.5623	271,682,166	8.4341	15,521,372	7.1909	0.8397	
Century Microfinance Bank Ltd	2015	Q2	0.0217	0.0436	0.2987	115,826,138	8.0638	16,489,388	7.2172	0.8281	
		Q3	0.0408	0.0412	0.3229	93,483,001	7.9707	15,050,947	7.1776	0.7823	
		Q4	0.0633	0.0664	0.3060	88,147,287	7.9452	17,359,968	7.2395	0.7798	
	2016	Q1	0.0133	0.0597	0.4085	89,167,854	7.9502	14,235,735	7.1534	0.7727	
		Q2	0.0291	0.0489	0.3140	103,254,695	8.0139	15,005,725	7.1763	0.7964	
		Q4	0.0584	0.0293	0.2922	103,323,540	8.0142	15,810,061	7.1989	0.8100	
	2017	Q1	0.0121	0.0616	0.3978	101,117,630	8.0048	17,081,523	7.2325	0.7983	
		Q2	0.0349	0.0592	0.3090	90,025,078	7.9544	16,942,674	7.2290	0.7955	
		Q3	0.0527	0.0576	0.2998	88,851,809	7.9487	16,247,276	7.2108	0.7843	
		Q4	0.0649	0.0458	0.2947	98,231,912	7.9923	15,983,567	7.2037	0.7946	
	Sumac Microfinance Bank Ltd	2015	Q2	0.0161	0.0562	0.3128	179,366,404	8.2537	15,003,576	7.1762	0.8951
			Q3	0.0254	0.0484	0.3008	184,566,862	8.2662	14,678,909	7.1667	0.8965
Q4			0.0314	0.0456	0.3301	198,484,270	8.2977	13,238,474	7.1218	0.8856	
2016		Q1	0.0080	0.0841	0.3597	195,962,086	8.2922	30,169,915	7.4796	0.8778	
		Q2	0.0163	0.0945	0.3770	206,328,561	8.3146	29,161,835	7.4648	0.8821	
		Q4	0.0360	0.0743	0.3624	210,877,927	8.3240	29,374,062	7.4680	0.8697	
2017		Q1	0.0099	0.0836	0.3506	202,699,639	8.3069	29,252,326	7.4662	0.8575	
		Q2	0.0180	0.0835	0.3695	216,387,023	8.3352	28,784,276	7.4592	0.8688	
		Q3	0.0262	0.0919	0.3754	219,009,371	8.3405	29,619,072	7.4716	0.8641	
		Q4	0.0317	0.0948	0.3867	222,417,298	8.3472	27,803,556	7.4441	0.8626	
		2015	Q2	0.0031	0.3571	0.4555	14,573,039	7.1636	28,487,642	7.4547	0.8898

U&I Microfinance Bank Ltd		Q3	0.0021	0.3507	0.4668	14,425,550	7.1591	28,635,634	7.4569	0.8899
		Q4	0.0035	0.2123	0.6657	14,135,528	7.1503	27,627,849	7.4413	0.8857
	2016	Q1	-0.0020	0.2129	0.6352	14,272,743	7.1545	15,694,727	7.1958	0.8889
		Q2	0.0044	0.1910	0.6430	14,419,461	7.1589	15,113,307	7.1794	0.8930
		Q4	-0.0199	0.2224	0.7074	13,917,895	7.1436	14,609,492	7.1646	0.8992
	2017	Q1	0.0015	0.2363	0.6538	13,697,179	7.1366	15,386,946	7.1872	0.9032
		Q2	-0.0109	0.2528	0.7311	13,620,906	7.1342	15,349,948	7.1861	0.9128
		Q3	-0.0214	0.2769	0.7700	13,423,571	7.1279	14,705,351	7.1675	0.9222
Q4		0.0326	0.2947	0.8079	13,455,744	7.1289	12,755,313	7.1057	0.9206	
Caritas Microfinance Bank Ltd	2015	Q2	0.0263	0.0409	0.3886	318,998,960	8.5038	15,271,509	7.1839	0.8564
		Q3	0.0358	0.0415	0.4031	323,948,110	8.5105	15,520,532	7.1909	0.8519
		Q4	0.0415	0.0394	0.4193	339,549,808	8.5309	15,802,759	7.1987	0.8548
	2016	Q1	0.0141	0.0403	0.3639	348,354,889	8.5420	21,903,335	7.3405	0.8431
		Q2	0.0283	0.0465	0.3792	360,041,467	8.5564	23,723,135	7.3752	0.8414
		Q4	0.0515	0.0477	0.4278	349,997,760	8.5441	24,713,782	7.3929	0.8284
	2017	Q1	0.0117	0.0458	0.4260	376,018,201	8.5752	23,398,523	7.3692	0.8227
		Q2	0.0235	0.0486	0.4247	380,086,859	8.5799	22,877,199	7.3594	0.8332
		Q3	0.0344	0.0656	0.4266	384,464,971	8.5849	27,156,264	7.4339	0.8285
		Q4	0.0431	0.0742	0.4494	382,829,640	8.5830	26,213,067	7.4185	0.8218
Daraja Microfinance Bank	2015	Q2	0.0016	0.1321	0.4625	99,936,791	7.9997	30,085,287	7.4784	0.8765
		Q3	0.0024	0.0906	0.5756	10,189,227	7.0081	29,751,830	7.4735	0.8730
		Q4	-0.0174	0.0726	0.7026	10,287,085	7.0123	31,316,228	7.4958	0.8647
	2016	Q1	0.0027	0.0659	0.4630	11,153,369	7.0474	13,721,500	7.1374	0.8319
		Q2	0.0074	0.0613	0.4869	11,197,836	7.0491	14,003,465	7.1462	0.8118
		Q4	0.0087	0.0856	0.5366	12,201,968	7.0864	14,439,951	7.1596	0.7984

	2017	Q1	0.0039	0.0816	0.5521	13,010,223	7.1143	16,490,956	7.2172	0.8092
		Q2	0.0077	0.0934	0.5543	13,959,064	7.1449	16,765,434	7.2244	0.8121
		Q3	0.0110	0.0873	0.5511	14,411,385	7.1587	17,032,990	7.2313	0.8149
		Q4	0.0124	0.0904	0.5609	14,465,074	7.1603	16,831,253	7.2261	0.8158
Maisha Microfinance Bank	2015	Q2	0.0005	0.2248	0.2248	16,187,543	7.2092	16,899,767	7.2279	0.8137
		Q3	0.0037	0.2578	0.2395	16,245,892	7.2107	17,653,876	7.2468	0.8245
		Q4	0.0248	0.2697	0.2425	16,345,823	7.2134	18,708,241	7.2720	0.8265
	2016	Q1	0.0011	0.2780	0.2575	16,347,860	7.2135	66,538,187	7.8231	0.8279
		Q2	0.0005	0.2943	0.2698	16,400,245	7.2149	64,907,602	7.8123	0.8243
		Q4	0.0058	0.2971	0.2733	16,418,382	7.2153	68,808,654	7.8376	0.8232
	2017	Q1	0.0014	0.3058	0.2800	16,435,365	7.2158	69,122,232	7.8396	0.8224
		Q2	0.0006	0.3038	0.3086	16,710,985	7.2230	69,895,556	7.8444	0.8259
		Q3	0.0049	0.2608	0.2470	16,127,993	7.2076	68,084,930	7.8331	0.8166
		Q4	0.0273	0.2511	0.2833	16,319,925	7.2127	67,986,372	7.8324	0.8205

Source: Researcher (2018)

