

**EFFECT OF INTEREST RATE CEILING ON MICRO LENDING
MARKET IN MIGORI COUNTY, KENYA**

BY

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DECLARATION

Declaration by the Candidate.

This Research Project is my original work and has not been presented for the award of a degree in any other learning institution.

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DEDICATION

This research work is dedicated to my family, Special dedication goes to my wife Lilian Akinyi Jagongo who took interest and sacrificed to see me through this project. To my parents and siblings for their love and support both morally and materially. Their encouragement and support has assisted me greatly in completion of this project.

ABSTRACT

Interest rate ceilings have been declining over the past several decades globally as most of the developing countries continue liberalizing their financial policies. Prior to 2015, Kenya's banking sector was vibrant and highly profitable. Sector loan book grew at an impressive compound annual growth rate of 16% from 2011 and 2015, Micro lending to gross domestic product was 35%. However, after the interest rate cap in August 2016, there has been a general slowdown to micro lending, January, 2016 (16.8% growth); August, 2016, (5.4 %growth) and December, 2016, (4.3% growth). Non-performing loans increased across the sector from an industry average of 5.2% before 2015 to an average of 7.9% as at September 2016. Studies relating to the interest rate ceiling and micro lending have given mixed results, some argue that it protects consumers from exploitation by guaranteeing access to credit at reasonable interest rates while others observe the contrary. It is on this basis that the study sought to establish the relationship between interest rate ceiling and micro lending. The objective of this study was to establish the effect of interest rate ceiling on micro lending market in Migori County, Kenya. The study was anchored on financial accelerator effect theory. Secondary data were collected from Bank Supervision Reports, published papers, official websites of commercial banks, and records kept by micro entrepreneurs. The data were on Credit Supply, Cost of Credit and Default rate covering 31 months from December, 2014 to June, 2017. The collected data were edited, coded and entered for analysis using the Statistical Package for Social Sciences (Version 17.0) computer package. The research findings were presented in tables for clarity. Pearson Correlation was used to assess bivariate association between the study variables and logistic regression model estimated to establish the existing relationships. The study revealed that there was a negative significant association between interest rate ceiling and credit supply ($r = -.718, p < .001$), and that of default rate ($r = -.795, p < .001$). However, its association with Cost of Credit yielded a positive significant result, ($r = .642, p < .001$). A binary logistics regression analysis fitted the three variables together with interest rate ceiling to predict the effect on micro lending. -2 Log likelihood (-2LL) 23.434, 25.894 and 19705 indicating that fitting the model was better than constant only model. Nagelkerke's R^2 results .577, .481, and .683, all indicated a greater improvement from null model to fitted model. Cox and Snell's R-Square for the estimated models shows that 42%, 34.4% and 50.3 % variations in Credit Supply, Cost of Credit and Default rate respectively is explained by the logistic model. Binary logistic classification and prediction indicates an improvement of 87.1 %, 83.9%, and 90.3 % from null model to fitted model. The Wald criterion demonstrated that Credit Supply, Wald = 11.743, $df = 1, p = 0.001$, Cost of Credit Wald = 9.962, $df = 1, p = 0.001$ and default rate Wald = 12.231, $df = 1, p = 0.001$, were significantly different from Zero thus the three independent variables were significantly affected by the interest rate ceiling. The study therefore recommends that Banks pursuing the policy of increasing credit supply and reducing cost of credit should advocate for the repeal of interest rate ceiling. However, those interested in reducing default rate should advocate for its retention. The findings of this study will be of great use to the researchers for future studies, government & lending institutions in formulating credit policies so as to promote the uptake of credit facilities in Migori County and even Kenya as a whole.

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ABBREVIATIONS AND ACRONYMS

CAGR	Compound annual growth rate
CBK	Central Bank of Kenya
CBN	Central Bank of Nigeria
CBR	Central Bank Rate
CRB	Credit Reference Bureau
CGAP	Consultative Group to Assist the Poor
DTMS	Deposit taking micro finance institutions
EIR	Effective Interest Rate
EBIT	Earnings before interest and taxes
FDR	Fixed Deposit Receipt
GDP	Gross Domestic Product
GOK	Government of Kenya
LACE	Loan Application and credit evaluation fee
MFI s	Microfinance institution
NPL s	Non-Performing Loans
PAR	Portfolio-at-risk
ROA	Return on Assets
ROE	Return on Equity
SPSS	Statistical Package of Social Sciences

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CHAPTER ONE: INTRODUCTION

This section opens the research with a brief of the background of the study, explaining the concept of interest rate capping, Micro lending and financial institutions. Giving the statement of the problem and a detailed illustration of theory that anchors the study.

1.1 Background of the Study

Banking is defined as an organization which provides facilities for acceptance of deposits and provision of loans, history begins with the first prototype banks of merchants, which made grain loans to farmers and traders. Dankwa and Badu, (2013) claims that modern banking is believed to have started in England and it grew out of the custom of goldsmiths who took in their customers' gold and silver for safe keeping. They then discovered that they could lend such precious metals out, keeping just a certain customer proportion as reserves. This was possible because not all the customers would come in for collection of their assets at the same time. This is how lending came into existence. According to Thomas, Edelman, and Crook, (2002), the phenomenon of borrowing and lending has a long history associated with human behavior. Therefore, credit is perhaps a phenomenon as old as trade and commerce. Dankwa and Badu, (2013) further describe lending as a major function of banks and is the main source of income to every banking institution.

In order to start a business, entrepreneurs need starting capital, this implies that when their personal savings are not enough to cover the amount of money needed by these startup costs, most entrepreneurs seek out a loan, the act of lending money in small amounts to impoverished individuals with aim of starting or running a small business is what could be termed as micro lending, Childers (2015) argues that the short history of modern micro lending began in Bangladesh. While a professor at Chittagong University, Yunus (1974) issued the first microloans to basket weavers in an economically depressed area of his country. A program that later evolved into Grameen Bank.

Yunus and Jolis (1999), explains that the said weavers were unable to purchase materials for the construction of their goods without an advance of money; in order to finance the purchase of

these raw materials, they were forced to rely on loans from local lenders who charged interest rates that left mere pennies of profit for the basket weavers after they repaid them. Childers (2015) elaborates that Yunus recognized that this cycle of poverty could be broken if the basket weavers were able to obtain just one loan with favorable terms that would allow them to retain their profits and reinvest them in their business. However, the disjoint here is that, banks are keener on risks associated with lending. Avevor (2016), indicated that it is because of the perception of higher risk, informational barriers, and the higher costs of intermediation for smaller firms, micro enterprises often cannot obtain long-term finance in the form of debt and equity. Nevertheless, Djankova, McLiesha, and Shleifer, (2007), stated that when lenders know more about borrowers, their credit history, or other lenders to the firm, get collaterals, they are more willing to extend credit.

For financial institutions to extend credit facilities to micro enterprises and remain sustained and active in the market, Khandare and Alshebami, (2015) suggested that it is mandatory for them to cover their costs and expenses incurred when carrying out such activities. Various costs such as Cost of borrowing, cost of operation, inflation cost, cost of default loans and other costs of delinquencies with the profit margin have to be recovered by MFIs so that they can continue working smoothly and effectively in the market otherwise they have to depend largely on the government subsidies or the donors grants which do not last forever. Mbengue, (2015), noted that over the past two decades, institutions that extend microloans to low-income borrowers in developing and transition economies have focused increasingly on making their operations financially sustainable by charging interest rates that are high enough to cover all their costs. In fact, Reille and Helms, (2004), pointed out that Microcredit costs are high, but not because lending to poor clientele carries inherently higher risk, but it is because of the greater delivery costs of tiny transactions that require face-to-face interaction and because MFIs use personal contact as a substitute for formal collateral or computerized credit scoring.

The high interest rates charged by many microfinance institutions (MFIs) have attracted the attention of policy makers throughout the world, (Reille & Helms, 2004). The issue which arises, here is, how can financial institutions, whose core business is to serve the disadvantaged poor people, charge them unreasonably high interest rates. This type of dilemma leads more than 40 countries in the world to impose ceilings on the interest rate demanded by MFIs as a way to

protect micro entrepreneurs from this practice (Mbengue, 2015; CGAP, 2004). Such ceilings are the results of governments facing cultural or political pressure to keep interest rates low. Imposing interest rate ceiling on lending makes it very difficult for the MFIs to recover their costs, consequently, MFIs curtail their lending to micro enterprises (Mbengue, 2015; Miller 2013).

According to Mohane, Coetzee & Grant (2002), when the Government regulates the working of the market, supply and demand cannot interact freely to find the equilibrium quantity and price. When there is an artificial cap on interest rates the allocation of resources is distorted if the equilibrium price is above the capped rate. Reille and Helms, (2004); Miller (2013), noted that ceilings that are set too low and those that are set too high are both problematic especially in cases where they do not cover fees and commissions and where the scope of ceiling is not clear, financial institutions may give the impression of compliance with the ceiling but charge fees and commissions that are not considered part of the cost of the loan, Maimbo & Gallegos (2014), observed that in South Africa, some financial institutions evaded caps by charging credit life insurance and other services, which reduced the transparency of the total cost of credit and in Armenia, the lack of clarity on how to calculate the interest rate led banks and microfinance institutions to impose fees and commissions, thus avoiding the ceiling and reducing the transparency for consumers. Mohane et al., (2002), further argue that the consequence is people who want finance, but due to their circumstances does not qualify at the ceiling interest rate are denied access. Interest rate ceilings make it difficult or impossible for formal and semi-formal micro lenders to cover their costs, driving them out of the market, (Reille & Helms, 2004). A good example is in Nicaragua, where microfinance institutions reduced lending, prompting a number of them to leave rural areas, due to high operational costs and risks.

Empirical studies indicate that caps on interest rates have been declining over the past several decades as most of the developing countries continue liberalizing their financial policies. The rationale for these changes is that making financial markets more accessible has a positive impact on growth, productivity, and poverty reduction, (Bekaert, Harvey & Lundblad, 2001). In United States, for instance, Laeven (2003) found that financial liberalization measures, such as the elimination of interest caps, positively affected small enterprises' access to finance. While in several countries the global financial crisis of 2008 reopened the debate on interest rate controls

as a tool for consumer protection. In fact, in some Countries such as El Salvador, the Kyrgyz Republic, and Zambia fresh interest rate caps on loans were introduced, while others like Japan imposed more restrictive caps, (Maimbo & Gallegos 2014).

Other scholars are of the opinion that interest rate ceilings can also be justified to protect consumers from usury and exploitation by guaranteeing access to credit at reasonable interest rates. They can also help protect the public interest by ensuring a fair and reasonable interest rate on loans. On the other hand, interest rate ceilings may also be a good way to limit access to credit to some impaired and low-income consumers, because they help avoid social harm (Reille & Helms, 2004). Studies show that interest ceilings on loans were successful in the Republic of Korea for the period 1956– 1994 and that financial liberalization did not significantly help increase financial depth, (Maimbo & Gallegos 2014).

Banking industry in Kenya is currently going through a development process that the majority of advanced economies have already been through, having introduced interest rate ceiling in August, 2016. The sector framework as at 31st December, 2015 comprised of 54 financial institutions, 42 of these are Banking institutions, and 12 are deposit taking micro finance institutions (DTMs) with the Central Bank of Kenya (CBK) as the regulatory body (Banking Survey, 2016), 1 mortgage finance company, 2 credit reference bureaus, 3 representative offices and 124 foreign exchange bureaus (CBK, 2014). Ideally, only 39 banking institutions operate (having excluded Charterhouse Bank which is still under suspension, Imperial Bank and Dubai bank which were both placed under receivership by the CBK in 2015).

Before the introduction of interest ceiling, Kenya's banking sector was observed as a vibrant, highly profitable sector, with the overall capital adequacy ratio averaged 19 % against a statutory minimum of 14.5 % and a liquidity ratio of 38.3 % as at end December 2015, (CBK, 2016). Industry's ROE's averaged at 20% while sector loan book grew at an impressive CAGR of 16%, micro lending to GDP was 35% on the back of high economic growth and low financial inclusion (AIB Capital, (2016), However, following the introduction of the interest rate cap in August 2016, Olaka, (2017), explains that there has been a general slowdown to micro lending, January, 2016 (16.8% growth); August, 2016, (5.4 % growth) and December, 2016, (4.3%

growth), more to this, he noted that banks have resorted to staff reduction, close some branches. AIB Capital (2016), explains that non-performing loans increased across the sector from an industry average of 5.2% before 2015 to an average of 7.9% as at September 2016.

From the foregoing literature, it is clear that studies have been done on interest rate ceiling and its impact on various aspects of micro lending market i.e. Credit Supply, Cost of loan and default rate. However, they have yielded mixed results, while some argues that ceiling is an inefficient tool for lowering interest rates and limits access to credit, reduces transparency and promotes lending to only credit worthy individuals, others are of the opinion that it protects the consumers from usury and exploitation by guaranteeing access to credit at reasonable interest rates. In addition, these studies have largely focused on developed countries whose GDP are higher than those of developing economies, like in the case of Kenya, therefore, results from such economies should be treated with a lot of caution when referring to the Kenyan Scenario. Consequently, a country specific study is inevitable for clear policy formulation. It is on this basis that the study seeks to establish the effect of interest rate ceiling on micro lending market in Migori County.

1.2 Statement of the Research Problem

The stability of the micro lending industry is an important prerequisite for economic stability and growth, this is because MFIs provide micro enterprises with the much needed capital to start business, the availed capital, if invested productively stimulates the economic growth. Before 2015, Kenya's banking sector was a vibrant, highly profitable sector, with industry ROE's average of 20%. Sector loan book grew at an impressive CAGR of 16% between 2011 and 2015. As at 2015, Kenya's micro lending to gross domestic product was 35%, as a result, Kenya's economy grew by 5.6% in 2015.

However, following the introduction of the interest rate cap in August 2016, there has been a general slowdown to micro lending, January, 2016 (16.8% growth); August, 2016, (5.4 % growth) and December, 2016, (4.3% growth). Non-performing loans increased across the sector from an industry average of 5.2% before 2015 to an average of 7.9% as at September 2016. Studies relating to the interest rate ceiling and micro lending have given mixed results, some argue that it protects consumers from exploitation by guaranteeing access to credit at reasonable

interest rates while others are of the opinion that ceilings is an inefficient tool for lowering interest rates and limits access to credit, reduces transparency and promotes lending to only individuals who are credit worthy. It was on this basis that the study sought to establish the effect of interest rate ceiling on micro lending market in Migori County, Kenya.

1.3 Objective of the Study

1.3.1 General objective

The general objective of the study was to establish the effect of interest rate ceiling on micro lending market in Migori County.

1.3.2 Specific objective

- i) To determine the effect of interest rate ceiling on credit supply to micro enterprises in Migori County.
- ii) To establish the effect of interest rate ceiling on the cost of credit to micro enterprises in Migori County.
- iii) To assess the effect of interest rate ceiling on the default rate by the micro enterprises in Migori County.

1.4 Research Hypotheses

This study seeks to test the following pertinent hypotheses;

H₀₁ : Interest rate ceiling does not affect credit supply to micro enterprises in Migori County.

H₀₂ : Interest rate ceiling does not affect cost of credit to micro enterprises in Migori County.

H₀₃: Interest rate ceiling does not affect the default rate by the micro enterprises in Migori County.

1.5 Scope of the Study

This study sought to establish the effect of interest rate ceiling on micro lending market in Migori County. The main variables under consideration was Interest rate ceiling and Micro lending. The study adopted correlation research design. Secondary data was collected from Bank Supervision Reports, published papers, official websites of commercial banks, and records kept by micro entrepreneurs. Logistics regression analysis was be used to determine the relationship between interest ceiling and micro lending. The researcher aimed to collect the data within a month and complete this study by end of July, 2017.

1.6 Justification of the Study

The availability of capital is critical for the development, growth and survival of a business. While it is reasonable to expect that these markets provide ample and diversified sources of capital to large firms, the picture is quite different for small businesses, and especially for micro-enterprises, MFIs even charge higher rates to micro-enterprises due to cost and risk associated with micro lending. An analysis of the effect of interest rate ceiling on demand for credit by micro enterprise borrowers is of significance and would help the researchers with future reference and citations; MFIs and Banks in decision making; the Government to formulate appropriate policies and Micro enterprises to plan their future borrowing. This study will serve as a basis for further research on the effect of interest rate ceiling to micro enterprises. It is hoped that study stimulate further study on optimal interest rate ceiling.

The choice of Migori County is because of its potential in terms of trade and choice of business to venture into, yet the trade industry in the County seems not to be as active. According to Migori County Government, (2013) the County is rich in industries i.e. Sony Sugar Company Limited, Sukari Industries Limited, British American Tobacco, Mastermind Tobacco, over 5,000 artisans registered in over 200 Jua Kali industries. Major trades in the industry include carpentry and joinery, metal and mechanical works. The County has Gold mining in Macalder, Rongo and Kuria, just to mention a few areas of trade. All these provides opportunities to supply raw materials, distribute the end products or intermediate as one can buy sugarcane from farmers and sale to Sugar Companies. The Proximity of the county to the Republic of Tanzania provides a critical base for the thriving of the cross border trade and form a major revenue source for the small scale traders in the region and beyond. Most of the micro enterprises in the County either

collapsed, have slow growth or are dormant and are not able to marshal sufficient capital to drive such businesses as seen before 2015. With the enactment of interest rate ceiling in August, 2016. It is expected that the Micro lending market in the County be even more vibrant than before, with a number of micro enterprises seeking loans either to start or grow their existing businesses, but this seems not to be the case, yet the County hosts a number of MFIs and Commercial Banks providing micro credit.

1.7 Theoretical Framework

This study was based on financial accelerator effect theory, borrowed from economic theory, and a variant of dynamic new Keynesian framework, the theory is attributed to Professor Ben Bernanke. According to Bernanke, Gertler and Gilchrist, (1996), financial accelerator results from changes in credit market conditions due to various economic shocks, which affect the intrinsic costs of borrowing and lending associated with asymmetric information. Miller, (2013) explains that asymmetric information where financial institutions are able to exploit information before its clients may lead to market imperfections resulting to adverse selection and moral hazard problems hence invalidating the standard competitive market results.

Bernanke et al., (1996), elaborates that the framework illustrates developments in the credit market that amplifies and propagate shocks to the macro economy. The key mechanism involves the link between "external finance premium", that is, the difference between the cost of funds raised externally and the opportunity cost of funds internal to the firm, and the net worth of potential borrowers (defined as the borrowers' liquid assets plus collateral value of illiquid assets less outstanding obligations). According to Almeida, Campello and Liu, (2006) the key idea behind the financial accelerator is the notion that shocks to the net worth of firms and households have a procyclical effect. With credit-market frictions present, and with the total amount of financing required held constant, standard models of lending with asymmetric information imply that the external finance premium depends inversely on borrowers' net worth (Bernanke et al., (1996). Miller, (2013) argues that MFIs face difficulties in measuring the borrower's creditworthiness when making credit scoring decisions, raising two fundamental issues: Clients that have lower risk are adversely selected and are likely to receive some form of credit, those that remain, will either be of high risk, or low risk but unable to prove. MFIs being unable to differentiate, will charge an aggregated rate which is attractive to the high risk client raising the

probability of default. On the other hand, clients borrowing at a higher rate might be required to make riskier investments in order to cover their borrowing costs again leading to high probability of default.

Scholarly literatures indicates that group lending methodology manages adverse selection risk by using social capital and risk understanding within a community to price risk. The problem is, interest rate ceilings are common at the lower end of the market where financial institutions use the information asymmetry to justify high lending rates. Practically in a normal financial markets larger commercial banks grant large credit at lower interest rates while MFIs give small amounts to a higher interest rate as illustrated in Figure 1.1;

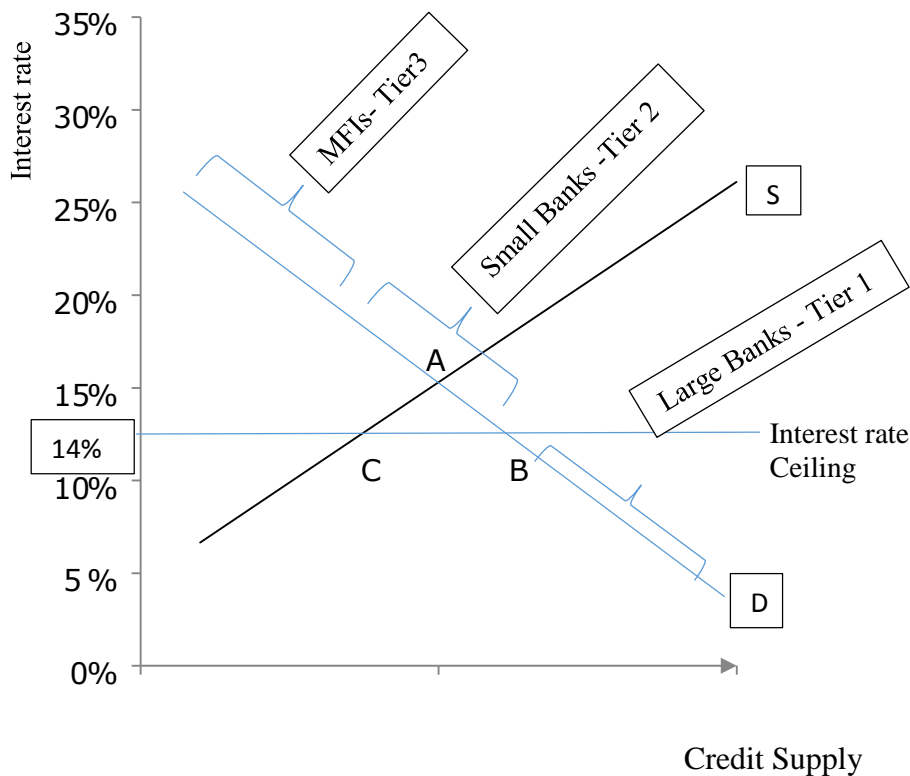


Figure 1.1: Imposition of an interest rate ceiling on demand schedule for credit.

Source: Adapted from Miller (2013); Mohane et al., (2002)

As illustrated above, when the government imposes a ceiling on interest rate at 4 % above CBR, that translates to 14%, Miller(2013) ; Mohane et al. (2002) explains that lenders are forced to move out the supply curve and increase access to credit bringing down lending rates – meaning, move from equilibrium A to a new equilibrium at B in the above graph, this however, assumes the risk and cost associated with micro lending (assuming that the cap is set below the market equilibrium – if above then lenders will continue to lend as before).

Explanations as above assumes how the banks and MFIs operating under asymmetric information will react. When ceiling is imposed, adverse selection problem is magnified and MFIs will lock out willing borrowers with unidentifiable creditworthiness. With such problems, MFIs can only intensify credit scoring processes to weed out bad borrowers- meaning increased overhead costs, increase lending- hence lending out to bad clients and pushing up non-performing loans. All of these options will increase costs and force the supply curve back to the left, reducing quantity of credit supplied, refuse credit to other clients and the market moves to point C. (Khandare & Alshebami, 2015)

1.8 Conceptual Framework

Independent Variable

Dependent Variable

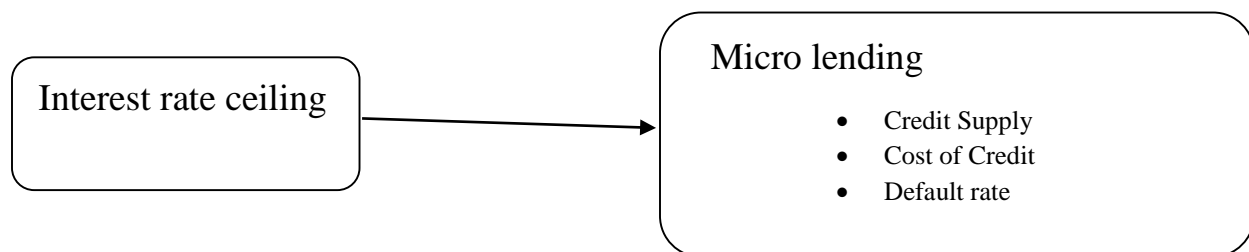


Figure 1.2: Conceptual Framework

Source: Author (2016)

To assess the appropriateness of interest rate ceiling as a policy instrument, one has to consider what makes up the interest rate which includes four components; NPLs, Overhead costs (such as processing cost i.e. LACE, outreach costs etc.), Cost of funds and Profit. However, this framework shelves the interest rate components, though one has to have them in mind because they will be required anyway to understand the basis for high interest rates, and instead resorts to the Components that constitute Micro lending Market (Credit Supply, Cost of Credit, Default rate), this is because when interest rates are capped, the rate remains constant and rarely changes, like the case of Kenya, can only change when CBR rate changes, therefore, its logical that one analyses Interest rate ceiling (independent variable) as a whole and its effect on the choice dependent variable, like in this case Micro lending Market.

CHAPTER TWO: LITERATURE REVIEW

This section reviews both theoretical and empirical literature relating to interest rate ceiling and micro lending.

2.1 Theoretical Literature Review

In finance there are several theories that attempt to explain how interest rates affect economies and how they can be used to forecast future changes. This study was guided by several theories; financial accelerator effect theory, Theory of financial repression, and Credit Rationing Theory. Each of these theories makes assumptions regarding the behavior of aspects of interest rate ceiling and focuses on the behaviors of other aspects of Micro lending.

2.1.1 Financial accelerator effect theory

Based on earlier work by Bernanke and Gertler (1989), Bernanke et al. (1996) developed a model in which there is a two-way link between the borrowing costs of firms and their net worth. In this model, entrepreneurs, who borrow funds to undertake investment projects, face an external finance premium that rises when their leverage increases. An introduction of interest rate ceiling, for example, reduces the return on capital resulting in a decline in the net worth of firms (Christensen & Dib, 2008). According to Coric (2011), Short run output fluctuations have usually been considered a result of various economic shocks. Identification of economic shocks and propagation mechanisms sufficiently large to explain short run volatility observed in macroeconomic time series has been the main issue of business cycle literature. The term financial accelerator is used for the economic shocks amplification, market imperfections and propagation mechanism.

This theory anchors my study very well as it explains the relationship between the external finance rate and entrepreneurs net worth. This relation rests on two assumptions, the first as given by Bernanke et al., (1996)states that the less the amount of his own wealth the borrower contributes to the project, the more his interests will diverge from the interests of the supplier of the external funds and the vice versa is true. Secondly, in cases when the borrowers have more information about projects characteristics or where they have the ability to take unobserved actions that can affect investment return, a greater incompatibility of interests between borrowers

and lenders increases agency costs. The types of agency costs depends on the way the information asymmetry in the credit market is modelled (Coric, 2011). In summary, monetary policy can influence aggregate economic activity through policy-induced changes in loan supply. In short, the tightening of monetary policy reduces banks' lending capacity which, in turn, causes a decline in loan supply and tightening of the lending conditions, and the reduction in overall economic activity.

2.1.2 Theory of financial repression

Financial repression is a deliberate and calculated distortion of financial prices by regulatory authorities in an economy, commonly referred to as McKinnon–Shaw hypothesis, the theory is attributed to McKinnon (1973) and Shaw (1973). It refers to the policies that places interest rate ceiling on deposits and lending, which increases the demand for credit and reduces credit supply. The theory explains how financial repression can distort and greatly interfere with the micro lending market resulting into adverse effect on economic growth due to reduced credit supply. Fry (1997); Demetriades and Luintel (1997) notes that the use of interest rate ceilings, distorts the economy, inhibits financial deepening by depressing real rates of interest.

Even though McKinnon's model emphasizes on a direct relationship between the demand for credit and physical investment in a business, Shaw model used the debt-intermediation view to show the whole process of financial intermediation, departing from the deposit accumulation and culminating in the expansion of the lending capacity of the banking institutions (Fernández, 2011).

McKinnon–Shaw framework argues that in order for an economy to experience economic growth via greater efficiency in capital accumulation and allocation, interest rate ceilings, credit control and other restrictive financial legislations should be removed (Orji, Ogbuabor and Onyinye, 2015) The essential common elements of the McKinnon and Shaw approaches can be summarized as illustrated in the Figure 3 below;

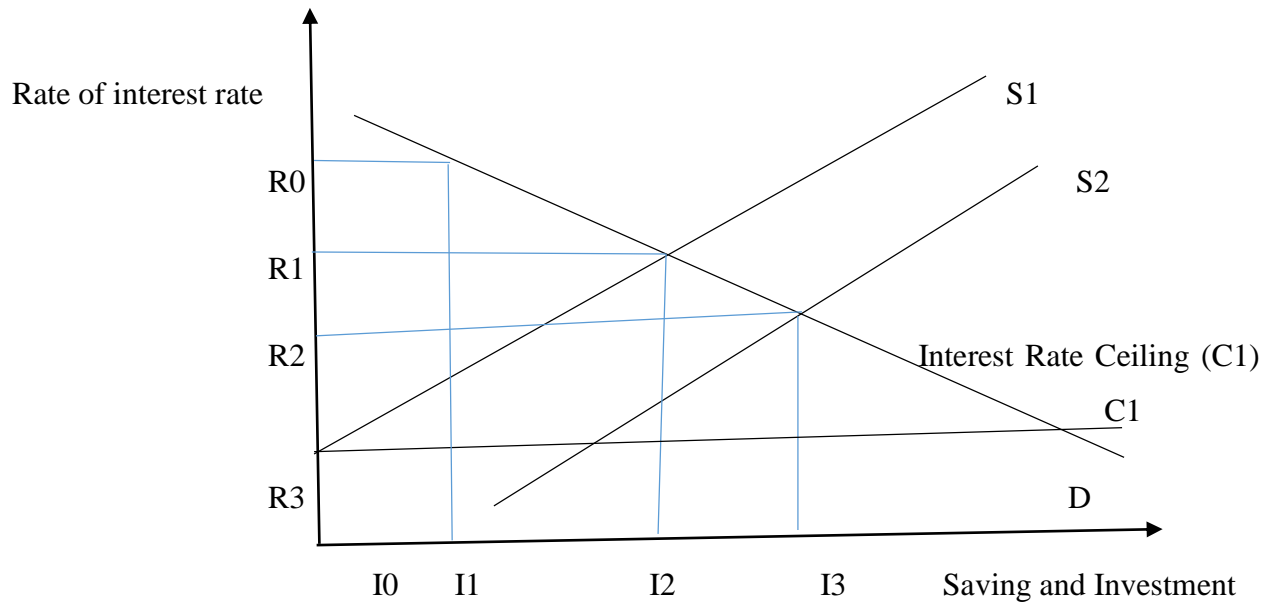


Figure 2.1: McKinnon and Shaw model for interest rate ceiling, savings and investment.

Source: Adapted from Orji, Ogbuabor and Onyinye, (2015)

The supply of credit (S1) is a positive function of the interest rate. The figure above shows that, at the interest rate (R1), the supply of credits appears as the binding constraint in the credit market, the investment is limited to the available amount of saving (I2). If the interest rate ceiling is applied (C1), the borrower will pay the ceiling rate (R3) resulting into high spread of financial intermediation (R0 – R3). This evidences the inefficiency of a banking system which operates with a deposit rate ceiling, this explains that a set of government regulations, laws, and other non-market restrictions prevent the financial intermediaries of an economy from functioning at their full capacity. (Orji, Ogbuabor and Onyinye, 2015)

From the foregoing illustration, this theory is relevant to my study in that, as given by the loanable funds theory and as explained by Bernanke et al., (1996) the less the amount of borrowers own savings, the more his interests will diverge from the interests of the supplier of the external funds and if the interest is capped, the borrowers with less savings will eventually be locked out of credit supply.

2.1.3 Credit Rationing Theory

This is a situation where demand for loans exceeds their supply and since economic theory has traditionally viewed market clearing and equilibrium as one thing, a situation where supply does not equal demand is perceived as disequilibrium and may be caused by external factor such as interest rate ceiling. Credit rationing was a seminal work of Jaffee and Russell (1976) and later developed by Stiglitz and Weiss (1981), the theory provides another framework for analyzing financial market inefficiencies. According to Stiglitz and Weiss, information asymmetry is regarded as the main cause of financial market malfunctioning in developing countries. Banks that advance loans are primarily concerned about the interest rate they receive on the loan and the riskiness of the loan. The interest rate a bank charges on loans have the tendency of affecting the riskiness of a pool of loans by either sorting potential borrowers – adverse selection effect; or affecting the behaviour of borrowers – moral hazards (Akowuar, 2011). According to Riley, (1987) credit rationing predicts that as the cost of capital rises, the bank may find it unprofitable and very risky to lend to certain groups of customers for which informational frictions are particularly large. Recent theoretical work of Chari, chourideh and jones, (2010) and Kurlat (2010) has extended these ideas to analyze how informational frictions affect the availability of credit during a financial crisis. Thus, when interest rates are capped at a rate lower than the equilibrium rate, borrowers who are not credit worthy drop out of the market due to adverse selection, reducing the credit supply.

Informational frictions such as adverse selection and moral hazard drive a wedge between the cost of capital and the interest rate faced by consumers. Dynamics in this wedge may play an important role in propagating the effects of macroeconomic and financial shocks on the economy (Curdia & Woodford, 2009), Chari et al. (2010) and Kurlat (2010) emphasized more generally in the literature on the financial accelerator (Bernanke et al. 1996), and have important implications for the transmission of monetary policy (Gertler and Gilchrist, 1993). It is important to note that information with the micro entrepreneurs is generally incomplete. The MFIs therefore cannot know with certainty the riskiness, honesty of the borrower, ability to repay, effort of the borrower, nor can he control what the borrower does with the money hence the possibility of loan default. With that in mind, banks will ensure proper appraisals are done and even employ other stringent measures locking out borrowers with less collaterals, grant less credit as

compared to what the client applied for depending on the outcome of the appraisal process, the foregoing literature makes this theory relevant to the current study.

2.2 Empirical Literature Review

2.2.1 Effect of interest rate ceiling on credit supply to micro enterprises

Emeka, Atong and Ene (2015), conducted a study on Trends in Profitability of Banks in Nigeria before and during Interest Rate Regulation with an objective of investigating the effects of interest rates on loans and advances. Ordinary least squares regression method was used. Unit root test was employed to ascertain the stationary levels of the variables before conducting the regression analysis. They concluded that interest rate has significant positive impact on loans advanced, rates when capped can have adverse effects on loan supply. Heng (2015) studied the Impact of the New Financial Services Law on Financial Stability and Inclusion, in Bolivia, the objective of his study was to examine the impact of the new financial services law in Bolivia including credit quotas and interest rate caps on financial stability and inclusion, he concluded that the interest rate cap had a material effect on financial inclusion, especially for micro entrepreneurs, as microfinance institutions reduced the number of loans to micro borrowers. Staten (2008) who conducted a study on the Impact of credit price and term regulations on credit Supply at Harvard University warned that caps on loan interest rates would contract supply and raise the cost of borrowing.

He further suggested that the economic evidence suggests that advocates of predatory lending laws tied to loan interest rates wield an extremely blunt instrument that imposes high costs in the form of lost opportunities. McKernan, Ratcliffe, Kuehn (2013) conducted a research on prohibitions, price caps, and disclosures: A look at State policies and alternative financial product use, at Urban Institute, United States of America, with an objective to examine the relationship between price caps and consumer use of products they concluded that more stringent price caps and prohibitions are associated with lower product consumption, their result showed a 32 % reduction in the use of loans. Miller, (2013), who researched on Interest rate caps and their impact on financial inclusion, In Zambia, however, thinks that there are occasions when an interest rate cap may be a good policy decision for governments. Where insufficient credit is being provided to a particular industry that is of

strategic importance to the economy, interest rate caps can be a short term solution. They can also promote fairness as long as a cap is set at a high enough level to allow for profitable lending for efficient financial institutions to Micro enterprises.

From the aforementioned literature, the methodology used in the stated literatures is different from that of the current study, while some used Ordinary least squares regression method, and not very clear sampling techniques. This study adopted correlation research design and Logistics regression analysis was used to determine the relationship between interest ceiling and credit supply. It can also be noted that the relationship between interest rate ceiling and credit supply is not clear, while some argue that it restricts credit supply, others are of the contrary opinion. Most of the research work highlighted above were done in developed countries and only few cases in Africa, like the case of Zambia, little or no research work has been done on effect of interest rate ceiling on credit supply in Kenya, in particularly Migori County.

2.2.2 Effect of interest rate ceiling on the cost of credit to micro enterprises

Reille & Helms, (2004), reviewed literature on interest rate ceiling and microfinance, they concluded with the results from following countries: In South Africa some financial institutions evaded caps by charging credit life insurance and other services, which reduced the transparency of the total cost of credit, In Armenia, lack of clarity on how to calculate the interest rate led banks and microfinance institutions to impose fees and commissions, thus avoiding the ceiling and reducing the transparency for consumers. iff/ZEW (2010) study of interest rate restrictions in the EU at an institute in Hamburg, Germany, relying on a data from literature reviewed and individual interviews administered to credit providers, noted that transferring the experience of one country to another requires strict assumptions on the behaviour of both demand as well as supply side in the credit markets and there are no alternatives to high cost credit for a subgroup of consumers. DeMuth, (1986) while studying the Case against Credit Card Interest Rate Regulation at Yale University, New Haven, United States of America noted that, the first effect of a binding national rate ceiling would be an increase in the demand for credit cards and a decrease in their supply. Card issuers would attempt to adjust to the increased demand by increasing their prices in ways not covered by the national controls.

Maimbo and Gallegos ,(2014), while studying Interest Rate Caps around the World: Still Popular, but a Blunt Instrument, a World Bank policy research paper 7070, explained that the effects of these caps points more to negative effects, an increase in illegal lending (for example, in Japan and the United States), an increase in the total cost of the loan through additional fees and commissions (as in Armenia, Nicaragua, and South Africa). Howell, Wilson, Davidson, (2008) conducted a research on interest rate caps: protection or paternalism at Griffith University Australia, the research depended on literature reviews as well as a survey and qualitative interviews, he concluded that Australian Capital Territory Consumer Credit Act approach to regulating interest rate caps is similar to that of New south wales consumer credit act, the approach ensures that a fairer system where hidden fees and charges do not enable credit providers to charge their customers extortionate amounts.

From the foregoing literature, it emerges that a number of them relied wholly on secondary data with few researchers depending on both interviews and secondary data. No clear research design, all have different methodologies, sample sizes and study area, none of the studies done in Kenya and consequently Migori County. The current study adopted correlation research design, and Logistics regression analysis was used to determine the relationship between interest ceiling and Cost of credit.

2.2.3 Effect of interest rate ceiling on the default rate by the micro enterprises

Amonoo, Acquah and Asmah (2003) conducted a study on the impact of interest rates on demand for credit and loan repayment by the poor, small and Micro enterprises in Ghana. The objective of the study was to determine the impact of higher interest rates on demand for credit and loan repayment, the study employed McKinnon Shaw hypothesis and purposive sampling method. Logit model was used to estimate the relationship between loan repayment and interest rate. They concluded that delay in granting loans by MFIs to Micro enterprises affects loan repayment.

They noted that 80% of those who were considered for loans did not receive it at the right time while 50% received less amount than what they applied for. Rossouw (2008) conducted a research on the impact of the national credit act on micro lending sales in a bank in South Africa,

The objective of the study was to determine the impact of the National Credit Act on the sales of a Micro Loan to a customer of a specific bank within South Africa. The research used data triangulation approach. Content analysis and constant comparative analysis was used. The research found that the National Credit Act which limited fees and rates on loans had a significant impact on the Micro Lending Market. The impact on the consumer's repayment on a micro loan was that defaults decreased following the implementation. Rigbi (2011) carried out a study on the effects of Usury Laws: Evidence from the Online Loan Market at Monaster Center for Economic Research, Ben-Gurion University, Israel.

The study was based on empirical studies. The study concluded that higher interest rate caps increase the probability that a loan will not be funded, especially if the borrower is risky. Abbas and Honghui (2016) Studied Empirical Evidence Impact of Interest Rate on Loan Repayment of Micro financial Institution in Tanzania, the study adopted descriptive assessment techniques, the data was collected through administering a questionnaire to a sample of 400 respondents, and analyzed by using SPSS software. They concluded that there was a strong negative correlation between multiple loans and positive correlation between business capacity and extent of higher interest rates charged. Kariuki and Ngahu (2016) studied effect of interest rates on loan performance of microfinance institutions in Naivasha sub-county, Kenya. The study adopted descriptive and Census research design. Data analysis was facilitated by the use of SPSS. Both descriptive and inferential statistics were used.

They concluded that microfinance institutions faced default on loans advanced which could be attributed to risky borrowers. The study further concluded that the interest rate charged on loans also led to defaults and hence loan non-performance. It was also concluded that MFI mitigated default of loans through blacklisting defaulters from getting loans in future. From the foresaid literature, it emerges that all determined effect of rates on loan repayment, non-clearly indicated how such ceilings may lead to default, a gap that the current study will bridge. While some employed purposive sampling method, the current study will use Simple random sampling technique. Logistics regression analysis was used to determine the relationship between interest ceiling and the default rate.

CHAPTER THREE: RESEARCH METHODOLOGY

Research methodology refers to the techniques used in carrying out research work, including the theoretical and philosophical assumptions upon which the research is based (Saunders, Lewis, Thornhill, 2009). These include, research design, target population, study area, data type and collection methods as well as the techniques that were used to analyze data and presentation.

3.1 Research Design

Research design is the overall plan for obtaining answers to the research questions being studied and for handling some of the difficulties encountered during the research process. Burns and Grove (2003) define a research design as a blueprint for conducting a study with maximum control over factors that may interfere with the validity of the findings. Kothari (2004) describe a research design as the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.

Study adopted correlation research design. Kothari (2004), states that correlation analysis studies the joint variation of two or more variables for determining the amount of correlation between two or more variables. In general, a correlational study is a quantitative method of research in which the similarities between two or more quantitative variables from the same group of subjects are determined.

3.2 Study Area

The study was conducted in Migori County. The County is situated in the South-Western part of Kenya. It borders Homa Bay County to the North, Kisii and Narok Counties to the East and the Republic of Tanzania to the South. It also borders Lake Victoria to the West. It is located between latitude $0^{\circ} 24'$ South and $0^{\circ} 40'$ South and Longitude 34° East and $34^{\circ} 50'$ East and covers an area of $2,596.5 \text{ km}^2$. It has eight Sub-counties namely: Suna East, Suna West, Nyatike, Uriri, Awendo, Rongo, Kuria East and Kuria West. The County has five major trading Centres which include Kehancha, Isebania, Migori, Awendo and Rongo with a total of 137,112 micro enterprises (Migori County Government, 2013).

3.3 Data Type, Sources and Collection Methods

The study relied on monthly Secondary data sourced from Bank Supervision Reports, published papers, official websites of commercial banks. The Secondary data were on Credit Supply, Cost of Credit and Default rate. The data covered December, 2014 to June, 2017 giving 31 observational points.

3.4 Data Analysis

The data was analyzed using SPSS version 17.0 software. Logistic regression analysis was used to describe the effect of interest ceiling on micro lending. Logistic regression works very similar to linear regression, but with a binomial response variable. According to Peng, Lee and Ingersoll, (2002), the central mathematical concept that underlies logistic regression is the logit—the natural logarithm of an odds ratio. The simplest example of a logit derives from a 2×2 contingency table. Generally, logistic regression is well suited for describing and testing hypotheses about relationships between a categorical outcome variable and one or more categorical or continuous predictor variables. The variables of credit supply, default rate and cost of loan was described. As adopted from Magali, (2013), the logit model is written as follows:

$$\text{Logit}(P) = \text{Log} \left[\frac{P_i}{1 - P_i} \right] \dots\dots\dots (1)$$

Where the term within the square brackets is the odds of an event occurring, i.e. odd of micro borrowers to perceive the impacts from using loans.

$$\text{Let: } \Pr(Y=1 \mid X = X_i) \dots\dots\dots (2)$$

Then we can write the model:

$$\text{Log} \left[\frac{P_i}{1 - P_i} \right] = \text{Logit}(P_i) = \beta_0 + \beta_1 X \dots\dots\dots (3)$$

$$\forall_i = 1-3$$

1^{st}_i = Increased Credit Supply or otherwise.

2^{nd}_i = Decreased cost of credit or otherwise.

3^{rd}_i = Decreased default rate or otherwise.

3.5 Data Presentation

The study relied on Secondary data sourced from Bank Supervision Reports, published papers, official websites of commercial banks, and other sources related to the research subject. The Collected data was edited and coded and entered into the Statistical Package for Social Sciences (SPSS) version 17 computer package for analysis. Correlation analysis was used to determine the relationship between the variables and interest rate ceiling. Logistic regression analysis was used to establish the effect of interest rate ceiling on micro lending market in Migori County, Kenya. The research findings presented in tables for clarity.

CHAPTER FOUR: RESULTS AND DISCUSSION

This section presents the findings on the effect of interest rate ceiling on the micro lending market in Migori County, Kenya. The study assessed Commercial Banks and MFIs micro lending reports in Migori County, Kenya - within 31 Months period; from January to 2015 to June, 2017, this was adequate to analyze the trends before and after the ceiling. Secondary data was collected from Bank Supervision Reports, published papers, official websites of commercial banks, and records kept by micro entrepreneurs. To achieve the study's objective, the data obtained was analyzed using correlation and logistic regression analysis.

4.1 Correlation Analysis.

Table 1 provides a matrix of the correlation coefficients for the variables, Interest rate Ceiling, Credit Supply, Cost of Credit and Default rate. Interest rate ceiling was negatively correlated to credit supply with a Pearson correlation coefficient of $r = -.718$, $p < .001$. This shows that 71.8 % reduction in credit supply was associated with interest rate ceiling. This implies that after the introduction of interest rate ceiling, MFI's experienced a reduction of 78.1% in the amount of loans disbursed. The null hypothesis that Interest rate ceiling does not affect credit supply to micro enterprises in Migori County was therefore rejected and the alternative hypothesis that Interest rate ceiling affects credit supply to micro enterprises in Migori County accepted. The output also shows that Interest rate ceiling is positively related to the cost of credit, with a coefficient of $r = .642$, $p < .001$. Implying that 64.2% increase in cost of credit was associated with the interest rate ceiling. This means that the cost of credit increased by 64.2% after ceiling. Consequently, the null hypothesis that Interest rate ceiling does not affect cost of credit to micro enterprises in Migori County was therefore rejected. The alternative hypothesis that Interest rate ceiling affects the Cost of credit to micro enterprises in Migori County accepted. Finally, Interest rate ceiling is negatively correlated to the default rate, $r = -.795$, $p < .001$. Meaning 79.5 % reduction in default rate was associated with interest rate ceiling. Loan repayment has been a major problem for the MFI's, therefore, a reduction of default rate by 79.5% can be a great achievement for MFI's and Commercial Banks.

As a result, the null hypothesis that Interest rate ceiling does not affect the default rate by the micro enterprises in Migori County was therefore rejected. The alternative hypothesis that Interest rate ceiling affects default rate of micro enterprises in Migori County accepted. Other interpretations that can be derived from the Table is that; there was a negative relationship between the credit supply and the cost of credit, $r = -.930$, $p < .001$, meaning the cost of credit can affect its supply by up to 93%. Credit supply was positively and significantly associated with default rate, $r = .656$, $p < .001$. Implying that increased credit supply increases default rate by 65.6%. Cost of credit is negatively correlated to default rate, $r = -.585$, $p < .001$.

Table 1. Correlation Matrix on the Interest Rate Ceiling and Micro lending.

		Interest Rate Ceiling	Credit Supply	Cost of Credit	Default Rate
Interest Rate Ceiling	Pearson Correlation n Sig. (2- tailed) N	1			
Credit Supply	Pearson Correlation n Sig. (2- tailed) N	-.718**	1		
Cost of Credit	Pearson Correlation n Sig. (2- tailed) N	.642**	-.930**	1	
Default Rate	Pearson Correlation n Sig. (2- tailed) N	-.795**	.656**	-.585**	1
		31	31	31	31

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

Source: Research Findings, 2017

4.2 Regression Analysis results

Logistic Regression analysis was used to establish the relationship between interest rate ceiling and micro lending market, considering majorly variables under micro lending market (Credit Supply, Cost of loan and default rate). A binary logistic model was specified and used for analysis to address the aim of this study.

4.2.1 Effect of interest rate ceiling on credit supply to micro enterprises.

A binary logistic regression analysis was conducted to determine the effect of interest rate ceiling on the credit supply on micro enterprises. The Secondary data collected was coded to give a binary data (Increased Credit Supply = 1 or Otherwise). The data was then analyzed using SPSS version 17.0.

As shown in Table 3, Cox and Snell's R-Square attempts to imitate multiple R-Square based on 'likelihood', but its maximum can be less than 1.0. In this model, 42% of variations in credit supply is explained by the logistic model. Nagelkerke's R² will normally be higher than the Cox and Snell measure. In our case it is .577, indicating a moderately strong relationship of 57.7% between the interest rate ceiling and the credit supply. This is an adequate descriptive goodness of fit test for the model, since it is >50%. The overall fit of the model is assessed using the log likelihood statistics a value that is multiplied by -2 to give -2Log likelihood (-2LL). Under this model, Table 4 shows -2 Log Likelihood statistics of 23.434, which is a slight improvement from the constant only model where it was 15.989 (Table 2), meaning that fitting the model will be better than the constant only model, therefore, it shows how good the model predicts the decision. Table 5, shows that 90% were correctly classified for increased Credit Supply and 81.8% for otherwise. Overall 87.1% were correctly classified. This is a considerable improvement on the 64.5% (Table 4) correct classification with the constant model, this shows that the model with predictors is a better model.

Table 2. Block 0: Binary logistic regression for Variables not in the equation for predicting likely effect on Credit Supply.

			Score	df	Sig.
Step 0	Variables	Interest Rate Ceiling	15.989	1	.000
		Overall Statistics	15.989	1	.000

Source: Research Findings, 2017

Table 3. Binary logistic regression results showing likely effect of ceiling on credit supply.

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	23.434	.420	.577

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Source: Research Findings, 2017

Table 4. Block 0: Binary logistic regression results for classification and prediction of Credit Supply.

		Predicted			
		Credit Supply			
Observed		Otherwise	Increased Credit Supply	Percentage Correct	
Step 1	Credit Supply	Otherwise	0	11	.0
		Increased Credit Supply	0	20	100.0
Overall Percentage					64.5

a. Constant is included in the model.

b. The cut value is .500

Source: Research Findings, 2017

Table 5. Binary logistic regression results for classification and prediction of Credit Supply.

		Predicted			
		Credit Supply		Percentage Correct	
Observed		Increased Credit Supply	Otherwise		
Step 1	Credit Supply	Otherwise	9	2	81.8
		Increased Credit Supply	2	18	90.0
Overall Percentage					87.1

a. The cut value is .500

Source: Research Findings, 2017

In the significant column from Table 6, the p-value is below 0.05. This means that there is a significant relationship between the credit supply and interest rate ceiling, Wald = 11.743, $df = 1$, $p = 0.001$. Confirms the general null hypothesis that the “B” coefficients are significantly different from Zero. The Exp(B) column in Table 7 presents the extent to which raising the corresponding measure by one unit influences the odds ratio. $\text{Exp}(B) = 0.25 < 1$, Meaning the probability of decrease in credit supply is higher than before the introduction of interest rate ceiling, in other words, the odds of decrease in Supply is 0.25 times more which is about 75% ($= 0.25 * 100 - 100$) after ceiling. The ‘B’ values are the logistic coefficients that can be used to create a predictive equation formula. $B = -3.701$ and the coefficient for the constant is shown in table 4 as 2.197 hence;

$$\text{Log} \left[\frac{P_1}{1 - P_1} \right] = \text{Logit}(P_1) = 2.197 + (-3.701)(\text{Interest Rate Ceiling})$$

Where; P_1 is Credit Supply.

Table 6. Binary logistic regression for effect of interest rate ceiling on Credit Supply. (Interest rate Ceiling: 1 or otherwise)

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1	Interest Rate Ceiling	-	1.080	11.74	1	.001	.025	.003	.205
	Constant	3.701		3					
		2.197	.745	8.690	1	.003	9.000		

a. Variable(s) entered on step 1: Interest rate Ceiling

Source: Research Findings, 2017

4.2.2 Effect of interest rate ceiling on the cost of credit to micro enterprises

A binary logistic regression analysis was conducted to establish the effect of interest rate ceiling on the cost of credit to micro enterprises. The Secondary data collected was coded to give a binary data (Decreased Cost of Credit = 1 or Otherwise). The data was then analyzed using SPSS version 17.0.

From Table 8, Cox and Snell's R-Square = .344, meaning this model indicates that 34.4% of variations in Cost of Credit is explained by the logistic model. Nagelkerke's R² = .481, indicating a relationship of 48.1% between the interest rate ceiling and the Cost of Credit. The overall fit of the model is assessed using the log likelihood statistics -2Log likelihood (-2LL). Table 9 shows -2 Log Likelihood statistics of 25.894, which is an improvement from the constant only model where it was =12.778 (Table 7), therefore, fitting the model will be better than the constant only model. Table 10, shows that 80% were correctly classified for decreased cost of credit and 85.7% for otherwise. Overall 83.9% were correctly classified. This is a good improvement on the 67.7% (Table 9) correct classification with the constant model so we know that the model with predictors is a significantly better mode.

Table 7. Block 0: Binary logistic regression for Variables not in the equation for predicting likely effect on Cost of Credit.

			Score	df	Sig.
Step 0	Variables	Interest Rate Ceiling	12.778	1	.000
	Overall Statistics		12.778	1	.000

Source: Research Findings, 2017

Table 8. Binary logistic regression results showing likely effect of ceiling on Cost of Credit.

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	25.894	.344	.481

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Source: Research Findings, 2017

Table 9. Block 0: Binary logistic regression results showing Cost of Credit was correctly classified and predicted.

		Predicted			
		Cost of Credit		Percentage Correct	
Observed		Decreased Cost of credit	Otherwise		
Step 1	Cost of Credit	Otherwise	21	0	100.0
		Decreased Cost of Credit	10	0	.0
Overall Percentage					67.7

a. The cut value is .500

Source: Research Findings, 2017

Table 10. Binary logistic regression results for classification and prediction of Cost of Credit.

		Predicted			
		Cost of Credit		Percentage Correct	
Observed		Otherwise	Decreased Cost of credit		
Step 1	Cost of Credit	Otherwise	18	3	85.7
		Decreased Cost of Credit	2	8	80.0
Overall Percentage					83.9

a. The cut value is .500

Source: Research Findings, 2017

Significant column in Table 11 indicates that the p-value is below 0.05. This means that there is a strong relationship between the cost of credit and interest rate ceiling, Wald = 9.962, $df = 1$, $p = 0.002$. The Exp(B) column presents the extent to which raising the corresponding measure by one unit influences the odds ratio. $\text{Exp}(B) = 24.000$, Meaning the probability of increase in cost of credit is higher with the introduction of interest rate ceiling, the odds of increase is 24 times more. The ‘B’ values are the logistic coefficients that can be used to create a predictive equation formula. $B = 3.178$ and the coefficient for the constant is shown in table 7 as - 2.197 hence;

$$\text{Log} \left[\frac{P_2}{1 - P_2} \right] = \text{Logit}(P_2) = -2.197 + 3.178(\text{Interest Rate Ceiling})$$

Where; P_2 is Cost of Credit.

Table 11. Binary logistic regression for effect of interest rate ceiling on Cost of Credit. (Interest rate Ceiling: 1 or otherwise).

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1	Interest rate	3.178	1.007		1	.002	24.00	3.335	.205
	Ceiling			9.962			0		
	Constant	-2.197	.745	8.690	1	.003	.111		

a. Variable(s) entered on step 1: Interest rate Ceiling

Source: Research Findings, 2017

4.2.3 Effect of interest rate ceiling on the default rate by the micro enterprises

A binary logistic regression analysis was conducted to assess the effect of interest rate ceiling on the default rate of micro enterprises. Secondary data collected was coded to give a binary data (Decreased Default rate = 1 or Otherwise). The data was then analyzed using SPSS version 17.0.

Table 13 indicates that $-2LL=19.705$ which is a slight improvement from the constant only model where it was $=19.581$ (Table 12), meaning that fitting the model will be better than the constant only. Cox & Snell R Square = .503 (a pseudo R Squared) explains 50.3% variance in the default rate. Nagelkerke R Squared = .683 explains 68.3% variance in the default rate. This is an adequate descriptive goodness of fit test for the model, since it is $>50\%$. Table 15 shows that 94.7% were correctly classified for decreased in default rate and 83.3% for otherwise. Overall 90.3% were correctly classified. This is a good improvement on the 61.3% (Table14) correct classification with the constant model hence the model with predictors is a significantly better mode.

Table 12. Block 0: Binary logistic regression for Variables not in the equation for predicting likely effect on Cost of Credit.

			Score	df	Sig.
Step 0	Variables	Interest Rate Ceiling	19.581	1	.000
	Overall Statistics		19.581	1	.000

Source: Research Findings, 2017

Table 13. Binary logistic regression results showing likely effect of ceiling on Default rate.

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	19.705	.503	.683

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Source: Research Findings, 2017

Table 14. Block 0: Binary logistic regression results showing Default rate was correctly classified and predicted.

Observed		Predicted			
		Default Rate		Percentage Correct	
		Otherwise	Decreased Default Rate		
Step 1	Default Rate	Otherwise	0	12	0
		Decrease in Default Rate	0	19	100
Overall Percentage					61.3

a. The cut value is .500

Source: Research Findings, 2017

Table 15. Binary logistic regression results showing Default rate was correctly classified and predicted.

		Predicted			
		Default Rate		Percentage Correct	
Observed		Otherwise	Decreased Default Rate		
Step 1	Default Rate	Otherwise	10	2	83.3
		Decrease in Default Rate	1	18	94.7
Overall Percentage					90.3

a. The cut value is .500

Source: Research Findings, 2017

From Table 16, the significant column indicates that the p-value is below 0.05. This means that there is a strong relationship between the default rate and interest rate ceiling, Wald = 12.231, $df = 1$, $p = .000$. The Exp(B) column presents the extent to which raising the corresponding measure by one unit influences the odds ratio. $\text{Exp}(B) = .011$, Meaning the probability of decrease in default rate with the introduction of interest rate ceiling is higher, the odds of decrease is .011 times which is about 89% ($= 0.11 * 100 - 100$). Interest rate ceiling is likely to reduce default rate given that the value $\text{Exp}(B) = .011$ is less than unity. The ‘B’ values are the logistic coefficients that can be used to create a predictive equation formula. $B = -4.500$ and the coefficient for the constant is shown in table 10 as 2.197 hence;

$$\text{Log} \left[\frac{P_3}{1 - P_3} \right] = \text{Logit}(P_3) = 2.197 + (-4.500)(\text{Interest Rate Ceiling})$$

Where; P_3 is Default Rate.

Table 16. Binary logistic regression results showing likely effect of ceiling on Default rate.

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step	Interest rate	-	1.287	12.23	1	.000	.011	.001	.138
1 ^a	Ceiling	4.500		1					
	Constant	2.197	.745	8.690	1	.003	9.000		

a. Variable(s) entered on step 1: Interest rate Ceiling

Source: Research Findings

4.4 Discussions of the Findings.

The study found that interest rate ceiling is a significant determinant of credit supply, cost of credit and default rate of micro enterprises. It follows therefore, as pointed out in both the background and literature review, and as confirmed by the study, that with the interest rate ceiling and intense competition and increasing globalization in the financial sector, MFIs and Banks must develop loan products that are customer-oriented in order to compete successfully in the competitive micro lending market. Due to this findings, it is true, to state as Staten, (2008) that interest rate ceilings makes small consumer loans from financial institutions impractical, pushing the underlying loan demand for small loans toward brokers and less reputable financiers (loan sharks) due to increased cost.

The findings that Interest rate ceiling affects micro lending market by reducing credit supply to micro enterprises was consistent with Fry, (1997), Demetriades and Luintel, (1997), McKinnon (1973) and Shaw (1973) all who stated that financial repression, i.e. interest rate ceiling can distort and greatly interfere with the micro lending market resulting into adverse effect on economic growth due to reduced credit supply. Bernanke et al., (1996) stated that the less the amount of borrowers own savings, the more his interests will diverge from the interests of the supplier of the external funds and if the interest is capped, the borrowers with less savings will eventually be locked out of credit supply.

Chari et. al., (2010) and Kurlat (2010) explained that informational frictions affect the availability of loans. Thus, when interest rates are capped at a rate lower than the equilibrium rate, borrowers who are not credit worthy drop out of the market due to adverse selection, reducing the credit supply. Heng (2015), while studying interest rate caps on financial stability and inclusion, in Bolivia, concluded that the interest rate cap had a material effect on financial inclusion, especially for micro entrepreneurs, as microfinance institutions reduced the number of loans to micro borrowers.

From the finding it is also clear that Interest rate ceiling affects micro lending market by increasing cost of credit to micro enterprises, this result is also supported by the views of Maimbo & Gallegos (2014), who observed that in South Africa that MFIs evaded caps by charging credit life insurance and other services, which reduced the transparency of the total cost of credit. They further stated that in Armenia, lack of clarity on how to calculate the interest rate led MFIs to impose fees and commissions not defined by the ceiling laws. Reille and Helms, (2004); Miller (2013), added that ceilings that are set too low and those that are set too high are both problematic especially in cases where they do not cover fees and commissions and where the scope of ceiling is not clear, MFIs may give the impression of compliance with the ceiling but charge fees and commissions that are not considered part of the cost of the loan.

The binary logistic result for the effect of Interest rate ceiling on micro lending market indicating that it reduced default rate by micro enterprises confirms findings by Rossouw (2008) who found out that limiting fees are rates on loans impacted on the consumer's repayment on a micro loan reducing default rate. Kariuki and Ngahu (2016) studied effect of interest rates on loan performance of microfinance institutions in Naivasha sub-county, Kenya. They concluded that microfinance institutions faced default on loans advanced which could be attributed to risky borrowers. The study further concluded that the high interest rates charged on loans also led to defaults and hence loan non-performance.

Therefore, the effect of interest rate ceiling on micro lending market results from this study, though ceiling is a relatively new concept in Kenya, was consistent with the existing studies studies.

4.5 Summary of the findings.

This study carried out an analysis on the effect of interest rate ceiling on micro lending market in Migori Bay County, The study particularly determined the effect of interest rate ceiling on Credit Supply, Cost of Credit and Default rate of Micro enterprises. The study noted that there are significant positive association between Interest rate ceiling and Cost of credit, $r = .642, p < .001$. The study thus deduced that 64.2% increase in cost of credit was as a result of interest rate ceiling implementation.

The study again reported significant negative associations between interest rate ceiling, Credit Supply and Default rate, $r = -.718, p < .001$; $r = -.795, p < .001$. Meaning the study showed that 71.8 % and 79.5 % reduction in Credit Supply and Default rate respectively was due to interest rate ceiling. The study therefore established that Default rate which has been a major problem for the MFIs can be reduced with the implementation of interest rate ceiling. The same results from correlation is supported by logistic regression analysis $\text{Exp}(B) = 0.25 < 1$; $\text{Exp}(B) = 24$; $\text{Exp}(B) = .011 < 1$ showing reduction in Default rate and credit supply while cost of credit increases.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The first objective of the study was to establish effect of interest rate ceiling on credit supply to micro enterprises. The study reveals that Interest rate ceiling was negatively correlated to credit supply with a Pearson correlation coefficient of $r = -.718$, $p < .001$. This shows that 71.8 % reduction in credit supply was associated with interest rate ceiling. Implying that interest rate ceiling, implemented in Kenya in August, 2016, discourages provision of micro credit due to the impossibility of recovering administrative costs that are associated with such lending.

The other objective of the study was to establish effect of interest rate ceiling on cost of credit to micro enterprises. When interest ceiling terms is not properly defined, MFIs may be forced to create additional and more stringent terms in effort to recover administrative costs, this not only reduces transparency about the borrowers true cost but also camouflages the actual interest rates charged by MFIs. Lending practices without prudent regard for repayment capacity of micro enterprises, deceptive terms, and unlawful collection techniques causes more damage to micro enterprises than do high interest rates. This probably explains the finding showing 64.2% increase in cost of credit, ($r = .642$, $p < .001$). Where lenders are known to be very profitable like in Kenya, then it might be possible to force them to lend at lower rates, by defining the maximum additional cost a lender can impose on borrowers, in the knowledge that the costs can be absorbed into their profit margins. Interest rate ceilings do not necessarily protect the micro lenders as it may be intended and can, in fact, hurt them by reducing their access to financial services as depicted by this study.

Even if such ceilings are intended to reduce usury and exorbitant lending by MFIs who charge very high interest rates, they are very difficult to enforce properly. These facts, however, do not minimize the critical need by the government to control and bring down the cost of micro lending in order to promote financial services access to all. There are situations, however, when interest rate ceiling may be a good policy decision by the government to MFIs.

While often used for political rather than economic purposes, they can help MFIs reduce their non-performing loan book (default rate) which has been a major problem to all lenders. This fact is supported by the finding that ceiling reduced default by huge margin, as huge as 79.5%, ($r = -.795, p < .001$) MFIs resorted to serious loan recoveries, they have also implemented stringent and tighter credit scoring procedures locking out those with dwindling loan repayment history and do not have proper security for their loans, and this could also explain the margin of reduction in default.

5.2 Recommendation

The study findings can benefit the Banking industry in Kenya. However, in view of the findings and conclusions of the study, the following recommendations are of particular importance to the banking industry in Migori County. The effect of ceiling was significant among the variables under consideration - credit supply, cost of credit and default rate. As established in the literature review, the intent of ceiling imposed by the government was to enhance financial inclusion by bringing down high interest rates, and since the findings shows adverse effects on credit supply which is the base to financial inclusion, it is imperative that MFIs diversify their products that is geared towards accommodating the micro lending industry so as to remain competitive and to avoid loss of customers, it is said that, it is easier to retain customers than to get new ones, hence the study recommends that MFIs should now balance their drive to make profits with a desire to serve micro enterprises by coming up with ways of reducing administrative costs, increasing credit supply, perhaps the implementation of online lending through mobile phones can suffice. If the government will not deregulate interest rates in the near future or has no intention of rescinding the decision cap rates.

The study used Secondary data only, this might not conclusively give results, and it is therefore recommendable that other studies be done using both secondary and primary data. Logistic regression analysis used also some disadvantages, other methods can also be employed to test data.

5.3 Suggestions for Further Research

The study takes note of the fact that it was done based on the Secondary rather than actual primary data. In actual sense, the study did not manipulate micro enterprises views to come up with data values only depending on data availed by MFIs. The study cannot therefore claim to have established the effect of these variables on micro enterprises hence a decision would require an experimental design. This study therefore recommends that an experimental study be conducted to determine the actual effect of these variables on micro enterprises seeking loan from the banking sector not only in Migori County, but in the banking sector as a whole. This study should form a basis for that study. The interesting study findings depicting reduction in credit supply and increased cost of credit yet the intension was to increase credit access by increasing credit supply and reducing cost of credit is an avenue for further research in the banking sector in Kenya. Since Logistic regression does not assume a linear relationship between the dependent and independent variables and requires the dependent variable to be a dichotomy and further assumes that the independent variables need not be interval, nor normally distributed, nor linearly related, nor of equal variance within each group, other models should be employed with no such assumptions so as a certain whether a similar result will be achieved.

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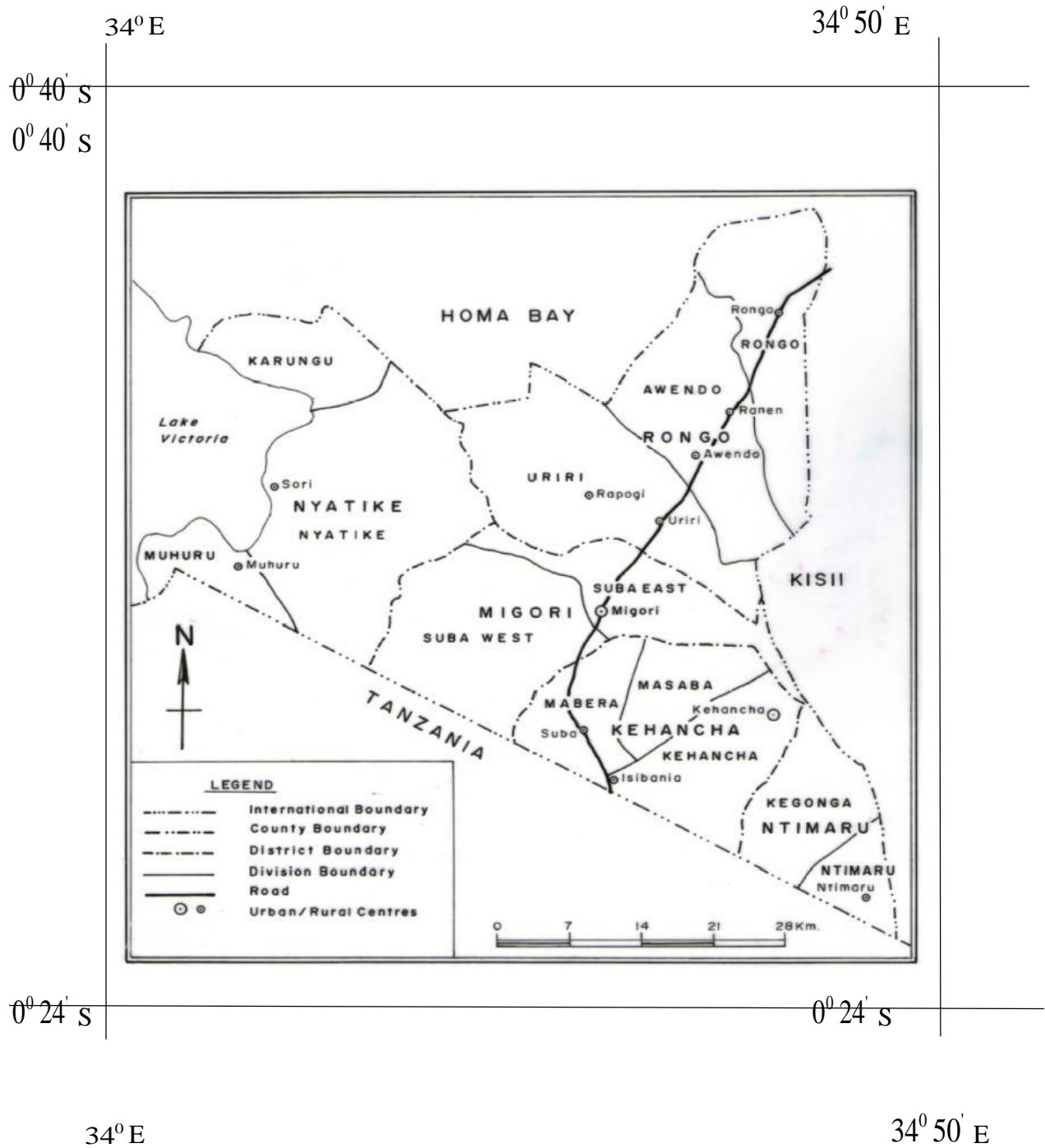
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APPENDICES

Appendix II: Migori County Map



Source: Migori County Government, (2013)

Appendix III: List of MFIs and Commercial Banks operating in Migori County

1. Equity Bank (k) Limited.
2. Kenya Commercial Bank (KCB).
3. National Bank of Kenya.
4. Co-operative Bank of Kenya.
5. Family Bank Limited.
6. Diamond Trust Bank.
7. Barclays Bank.
8. KWFT Deposit taking Micro Finance Bank.
9. Post Bank.