THE IMPACT OF EFFICIENCY OF DEPOSIT-TAKING SACCOS ON THE COST OF CREDIT IN KENYA

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DECLARATION

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

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Approval

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ABSTRACT

The study aimed to determine the impact of efficiency of deposit-taking SACCOs on the cost of credit in Kenya. To be more precise, establish the level of efficiency of deposit-taking SACCOs, establish the nexus of SACCO efficiency, and the intervening inflation effect on the cost of credit in Kenya. The study used a correlation research design to determine the relationship. The sample used 42 deposit-taking SACCOs in the country which was compiled from the SASRA regulations 2019. The study used secondary data for five years, 31st December 2015 to 31st December 2019, which will be considered sufficient for the study and will be analyzed to determine the relationship between the variables to be used in the study. From the findings, 52% was the average value of the DT-SACCO technical efficiency and Afya Sacco Societies Limited was the most technically efficient overall. Technical efficiency had a negative relationship with the control variables and this resulted in a drop in their operations while cost efficiency had the same negative relationship but resulted in a rise in their operations. The independent variables, inclusive of control variables, had different impacts on the Cost of Credit in Kenya. Technical efficiency and competition had a positive impact of 505.27 and 0.000000414 respectively while cost efficiency and size had a negative impact of -48,884.79 and -3,171.53 respectively. The mediating variable, inflation rate, had a negative intervening effect of -5.2830 on the impact of DT-SACCO efficiency on the Cost of Credit in Kenya. The study recommends that the DT-SACCOs should cap and inform the people of their cost of credit to ease the research for future purposes and for the smaller DT-SACCOs to merge to form bigger ones resulting in economies of scale. Hence, the study concluded, by meeting all objectives, that the efficiency of deposit taking SACCOs has an impact on the Cost of Credit in Kenya.

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ABBREVIATION AND ACRONYMS

AIMR	Association of Investment Management Research
DEA	Data Envelopment Analysis
DT-SACCO	Deposit-taking Savings and Credit Co-operatives
KNBS	Kenya National Bureau of Statistics
KUSSCO	Kenya Union of Savings and Co-operatives Ltd.
RPED	Regional Program on Enterprise Development
SACCO	Savings and Credit Co-operatives
SASRA	SACCO Societies Regulation Authority (SASRA, 2015)
SEM	Structural Equation Modeling

DEDICATION

I dedicate this to my family members who gave me invaluable moral support throughout the period. They have instrumental and inspirational to my starting and concluding the undergraduate degree program. I will forever cherish them for being there for me and to appreciate the irreplaceable support that gave me the incentive to soldier on.

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CHAPTER ONE: INTRODUCTION

1.1 Introduction

Savings and Credit Co-operatives (SACCOs) were first established in 1844 by the Rochdale Society of Equitable Pioneers (Muriuki, 2010). The co-operative's ideology was introduced to Kenya in 1908 and was first established in the dairy industry and later on to be known as Kenya Co-operative Creameries in 1925 to date. Many co-operatives began being formed and through government intervention, greatly contributed to the development of the economy of Kenya. Eventually, in 2008, a SACCO Society Act was enacted and followed with collaboration from the Front Office Services Activities (FOSA) to ensure the standards from deposit-taking SACCOs', especially, are cost-effective. Furthermore, SACCO Societies Regulation Authority (SASRA) was established to control the deposit-taking SACCOs which has currently licensed about 174 deposit-taking SACCOs, which is categorized as 12 restricted and 162 non-restricted. Since then, 30% of Kenya's Gross Domestic Product (GDP) was captured by the contributions generated from these SACCOS. Moreover, the deposit-taking SACCOs, as licensed by SASRA, account for about 80% of the total accumulated savings in Kenya.

1.2 Background of the Study

1.2.1 Deposit-taking SACCO in Kenya

According to Nuwagabe (2012), SACCOs are a community founded the financial institution that offers the members financial support through providing loans and assists them in forming saving plans for future goals or developments. In doing so, the members are enabled to develop their economic interests. The importance of deposit-taking SACCOs was emphasized through the words of Kuria (2011) when he defined its most popular service being its savings system which has become the steadiest way to break the brutal cycle of poverty. Moreover, it has become fundamental to sustain economic development.

As mentioned above, SASRA was established to protect the SACCOs members' interest and ensure public confidence in SACCOs to spur economic development. The deposit-taking SACCOs operate under the basic principle of deposits and loans, however, these types of SACCOs have an efficient way of handling their operations with control variables and certain regulations in place. The efficiency in which they operate their operations is branched into two, one of them is the input

which includes savings, borrowed funds, and shared capital, whereas the other is the output which includes loans and special savings.

SACCOs having a stable and efficient operating system in both the financial and ethical departments are assumed to have a more powerful influence on a country's economic development. Some of the effects it has control over are like calculating and swaying a member's capital level of formation and the SACCOs' efficiency in capital allocation to its members. As per Kenya Union of Savings and Co-operatives Ltd. (KUSSCO, 2012), deposit-taking SACCOs are required to conduct their operations following both the SACCOs Society Act (2008) and The SACCOs Society (Deposit-taking businesses only) regulations (2010). Other than the FOSA accounts, the deposit-taking SACCOs also have Back Office Service Activities (BOSA) accounts which enable a member to make deposits and access credit services. These savings are non-withdrawable unless one wishes to exit the SACCO. Moreover, the contributions depend on the higher value between a monthly contribution of Kshs. 2000 or 10% of the basic salary.

Ever since the SACCO Societies Act was enacted in 2008, the SACCOs have generally experienced a shocking growth rate of registering more than 3 million members. Moreover, the SACCOs have been ever generating more in the mobilized deposits as compared to the credit that is usually disbursed. The SACCOs have further developed and upgraded their financial positions to reflect the activities that normally take place in banks. Examples of these activities include deposit-taking (mainly), provide saving facilitation, and offering money transfers. Also, through the FOSA accounts, they can perform disbursement of credit to members in the form of lending.

SACCOs' development history is long evident from their sturdy growth and creating significant contributions to the overall economy. The contributions that have been made to the national development were recognized by the government and the contributions were found to be connected with all the sectors of the economy which include agriculture, manufacturing, and tourism, among others.

Malombe (2011) stated that SACCO members will be taken in making deposits to SACCOs that meet their lending needs as well as those that give high dividends. He furthermore stated how SACCOs are required to cope with the new regulatory framework especially on the mandatory capital requirements, developments of dividend policy, and its economic value to the SACCOs.

These regulations are what permits SACCOs to collect deposits and thus gain a cheaper and more stable source of capital (Ledgewood & White, 2006)

1.2.2 SACCO Efficiency

Efficiency in a SACCO is important as it assists in promoting access to financial services as well as more affordable services that SACCO provides. Efficiency is also used in withstanding negative shocks and provides a contribution to the financial system's stability. SACCOs are further required to be constantly assessing and maintaining their efficiency at the highest possible level. However, continued implementation of a regulatory framework without a deeper understanding of its inherent influence on the performance and efficiency of the regulated institutions will not only subject a core sector in the economy to uncertainty but also increase the inherent risk.

Inefficiency in regards to risk management is a result of granting credit based on one's contacts and social pressure which eventually results in non-performing loans. Moreover, inefficiency results from information asymmetry whereby a party having more information will have intensive tendencies to behave inappropriately which is followed by rapid growth thus enhancing the active participation between lenders and borrowers. The efficiency of a SACCO has a positive relationship with its size given that larger SACCOs have a higher share of equity capital in assets and better efficiency is related to improved levels of profitability.

Technical efficiency can be defined as the extent to which SACCOs could reduce input costs for a given level of output or the output expanded for a given level of input. The reduction of inputs or expansion of output is what defines the technical efficiency of a SACCO. Whereas the cost efficiency is the extent to which SACCOs incur a minimum cost in their operations to produce a given level of output. Regulations of cost efficiency are necessary for the evaluation of maximizing the members' value in the SACCO. Moreover, to improve SACCOs' cost-efficiency, they are required to adopt the latest technological upgrades and its relation to the economies scale is due to the growth of the SACCO in terms of its size.

1.2.3 Efficiency of Deposit-taking SACCOs

Efficiency is a critical aspect for organizations as it is directly associated with the gains of the present and the future, intensity, and dissolvability. Organizations request administrative powers for financially savvy administrative arrangements and the related items. With fewer resources used to increase profitability, then, and only then, can a business entity be said to be efficient. Moreover,

the better utilization of resources in an operation leads to higher levels of efficiency within the organization or SACCO. The operational efficiency of deposit-taking SACCOs can be further influenced by placing qualified and skilled personnel to control the institutional distribution of the funds and put in place proper control measures. Deposit-taking SACCOs having a higher asset to loan ratio are said to have higher efficiency due to the direct relation between credit risk and efficiency of the business. Credit risk is the probability that defaulters are expected to default. Simply put, this is when the borrower requests for a certain loan product but will be unable to pay the loan back thus the deposit-taking SACCOs lose any interest related to it.

1.2.4 Effects of inflation rates on Deposit-taking SACCOs

Inflation, according to Labonte (2011), is defined as the continual rise in overall price levels or the ceaseless fall in the money value. From the study carried by Schiller (2003), he identified that there are different types of inflation and the most ubiquitous type of inflation is the excess demand inflation. This type of inflation occurs when the total demand for goods and services in an economy exceeds the available supply, so the prices rise in a market economy. It was, moreover, found that this type of inflation was also the most serious amongst all the various types of inflation. Inflation can, thus, be identified as a quantifiable measure of the rate at which the average price level of a basket of selected goods and services in an economy gradually rises over some time. Savings in deposit-taking SACCOs are also, in one way or another, related to the inflation rates. The most common argument amongst Kenyans is about how the expectation of an increase in the prices, the expenditure is also expected to advance over time. Furthermore, if the investment goods were on expenditures, as a result, the savings that were measured will also be expected to increase, however to others, the levels of consumption are what is expected to increase.

Howard (1978) stated that, in a household, different groups show different tendencies to consume and are subject to different taxes, thus, the redistribution will have an effect on their aggregate savings. The lending rates of various financial institutions are affected by inflation. When there is high inflation in the country, the cost of living goes up and vice versa is proven true. Moreover, it can be noted that some SACCOs have been reported by their members that they charge high-interest rates. Unknown to them, inflation is a factor that SACCOs cannot control which causes the specified financial institution to look for alternative ways to control the lending rates and one of the alternatives is by coming up with strategies to minimize the cost of operations.

1.2.5 Cost of Credit

Loans are a particular service provided by the SACCOs but some use their physical assets as security. In such a case, the cost of credit is introduced. Cost of credit can be defined as the total amount payable for a loan which includes the estimation of third-party costs, such as valuation and legal fees, in cases of loans being secured by a physical asset. The various lending institutions such as the deposit-taking SACCOs provide different interest rates while looking into the market conditions, the degree of risks, and the institution's objectives (Mwenda & Muuka (2004)). The cost of credit is greatly influenced by various factors within a given economy among the supply and demand forces in regards to the credit, the inflation rates, the T-Bills auctioned by the Central Bank of Kenya, and the type of loan one applies for. The theory is widely agreed that interest rates play an important role in an economy's success. Higher interest rates and debt payments contribute to lower loans and thus lower expenditures for households and companies alike. In comparison, lower interest rates typically contribute to higher expenditure. This has a net effect on the output of small and medium-sized enterprises in every economy (Institute for Economic Affairs, 2000).

Cost of credit can also be considered a hindrance; people look for substitute credit sources of credit like investment groups or the commonly known 'chamas'. For potential borrowers, they aim for alternative sources that are known to offer a lower cost of credit. Allen (2013) assessed that other factors affecting the borrower's uptake for the credit facilities offered by financial institutions which include a range of products, extensive branch network, and transaction costs. Moreover, according to Modigliani & Lessard (1974), the stated that the gradual decrease in the household debt purchasing power, the consequences of the escalation in interest rates will offset. This can also be defined to mean that due to inflation, the annual loan repayment will increase, and this is due to an increase in the interest rate being charged, however, this might not necessarily increase the total cost of credit. Furthermore, the closer an organization is to a deposit-taking SACCO, the better the terms of credit it can negotiate in terms of the cost of credit and the applied interest rates. Also, an efficient cost of credit at low levels can be attained from desiring a fully functioning credit referencing system, and stabilizing the inflation rate will make the cost of credit more affordable to the members of the SACCO.

1.3 Statement of the Problem

There are many ways of enhancing income, but the most common way is through investments. Keynes (1936) stated that investments can be described as a development effort given the primary component and productivity has been fully promoted to break poverty's malicious cycle. In 2005, the United Nations Conference on Trade and Development (UNCTAD) stated the weakening of public infrastructure, problems associated with the governance, and lack of security having discouraged private investments in Kenya. The situation was made worse during the post-election violence in 2007 where there were more public and private properties that were vandalized and destroyed decreasing the initiative people had to invest in Kenya.

However, in 2008, the SACCO Society Act was enacted, and also the establishment of SASRA was performed in the same year. This enactment was essential as SACCOs were globally and nationally identified as the vehicle for economic growth. Kyendo (2011) confirmed that the lending for deposit-taking SACCOs to be 12% per annum which is lower than the lending rates of the banking sector which is 12.19%. Inflation in Kenya is another aspect to look into as it has been swinging unpredictably for a long period. Back in 1993, it went as high as 45.98% but for the last eight years, it has been below ten percent. These variations in inflation rates have been having an effect on the purchasing power of households thus directly having an influence on the consumption and saving patterns for many citizens.

From the background of the study, it can be noted that SACCOs have contributed greatly to the economic development of Kenya, however, some still oppose this statement. There have been various studies that have been carried out in relation to efficiency, however, a small number of them have dealt with the impact of the efficiency of deposit-taking SACCOs. Moreover, the studies have heavily done their research based on the banking sector. From that fact, a gap is evident in knowing what impact the efficiency of deposit-taking SACCOs has on the cost of credit and thus this study will be sought to lessen this knowledge gap.

1.4 Research Objectives

1.4.1 General Objective

The overall objective of this study is to analyze the impact of the efficiency of deposit-taking SACCOs on the cost of credit in Kenya.

1.4.2 Specific Objectives

More specifically, the study will seek to:

1. Establish the level of efficiency of deposit-taking SACCOs in Kenya.
2. Establish the nexus between SACCO efficiency and the cost of credit.
3. Establish the intervening effect of inflation rates on the relationship between SACCO efficiency and the cost of credit.

1.5 Research Questions

1. Does technical and cost efficiency have any significant effect on the operations of deposit-taking SACCO?
2. What is the nexus between SACCO efficiency and the cost of credit?
3. Do inflation rates have any significant intervening effect on the relationship between SACCO efficiency and the cost of credit?

1.6 Scope of the Study

The scope of the research encompasses the effects of SACCOs' efficiency, together with the intervening variable, on the cost of credit of Kenya over 5 years, most preferably the last half-decade.

1.7 Significance of the Study

1.7.1 SACCO management and boards

This study will help the deposit-taking SACCOs' management and board team by proving to them how their efforts are positively contributing to the economy, especially through the services they offer. This also helps to prove that deposit-taking SACCOs do their utmost best to meet the national economic goals which are directly used to build the national capital for economic development.

1.7.2 Regulators and policymakers

The regulators and policymakers will benefit from this study by providing them with evidence showing the relevance of the decisions made on the implemented policies. Moreover, from the suggestions that this study will propose, some policies may be introduced or amended to make the approved policies more effective. Also, they will get to know whether the DT-SACCOs are operating fairly and efficiently in their attempts to stabilize the financial sector.

1.7.3 Academicians and researchers

This study may be beneficial to academics as they will be able to gain a better understanding of the efficiency of SACCOs and how it affects the economic performance of the country. The academics can also use this research to build upon the topic of analyzing the impact of the efficiency of deposit-taking SACCOs on the cost of credit in Kenya.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The literature reviewed in this chapter is related and consistent with the research topic stating how the efficiency of deposit-taking SACCOs is impactful on the cost of credit in Kenya. The importance of this chapter is to determine whether there is an information link between the current study and previous research papers and what the future studies will need to investigate to improve the knowledge in the fields associated with the study. In particular, what this chapter reviews are the theoretical review of literature, the empirical review of literature, the critiques of literature, the research gap, conceptual framework, and the summary of the literature review.

2.2 Theoretical Review of Literature

This study was guided through the use of two theories: The Theory of Financial Intermediation and

2.2.1 Theory of Financial Intermediation

Financial Intermediation is a process that simplifies the flow of funds between savers and borrowers, thus ensuring that financial resources are allocated efficiently towards promoting economic growth and development. According to Levine, Loayza and Beck (2000), the theory of financial intermediation has a key function in the banking relationship to overcome information asymmetry between the borrower and the lender, and thus continuous interaction enables the lenders to produce creditworthy information to the borrowers. The availed information provides a strong proportion to credit and loan officers to assess and appraise the credit to the borrower. Navapan & Tripe (2003) also added that the financial intermediaries exist due to their ability to decrease both transactional and informational costs arising from information asymmetry.

SACCOs, being one of the institutions in the financial sector, typically constitutes valued varied credit information details on the ability to calculate the value of securities and assets offered in the market. From various theoretical studies, there was an established relationship between financial intermediation and economic growth. The cost of credit having a relationship with the mentioned relationship in that if the cost of credit increases, it essentially means that there is an increase in consumer spending, income levels, and the gross domestic product thus, eventually the economic development increases. From this, it is evident that credit is important in the financial

intermediation process in which it provides funds to the economic entities that will put the funds to their most productive use. The theory further stated how these financial intermediaries help the markets functioning efficiently.

SACCOs' efficiency is further elaborated in how they take numerous risk measures with the use of credit technology in the process of collecting the employees' and members' private information and also in the ways they treat, screen, and monitor the borrowers.

2.2.2 Default Risk Theory of Credit Rationing

This theory states that the higher interest rates raise the default risk which in turn leads to lending losses. The unrestricted and rational lenders prefer setting the loan interest rates below the clearing levels and then ration the credit. This action was carried out to avoid lending losses as explained in the theory. Credit rationing is when the demand for loans exceeds the supply of loans at the loan interest rate determined by the banks. In simplified terms, excess demand for credit at a given interest rate will not cause the banks to increase the loan interest rates which will result in the demand to equal the supply. Thus, this argument is finalized by Stigligz and Weiss (1981) by stating that the excess demand is rationed by the non-price criteria. No synchronization between deposits and loans will incur costs as the financial institutions continue their intermediation between the demanders and suppliers of funds.

From the Stigligz and Wiess framework, it can be explained with an example. Persons A and B have uniformly distributed returns, A has lows of 75 shillings and highs of 125 shillings with a mean of 100 shillings while B has lows of 50 shillings and highs of 150 shillings with a mean of 100 shillings but B was found to be riskier as compared with A. The bank will use the interest rates as an instrument and in its absence, it is used to identify the borrower types. This also arises from the differences in riskiness the banks imply from and keeping in mind that each borrower has different probabilities of repaying the loan which in turn affects the bank's expected return. The framework thus proves that those who accept a higher interest rate in their loan is because they know the riskiness of their project with lower probabilities of repaying the loan. In conclusion, interest rates have two effects on the bank's expected return. Higher interest rates will imply the repayments will be higher and increase the bank's profit while the other is that higher interest rates might mean that the safe types of investors are not willing to accept the loans resulting in them dropping out of the market.

2.3 Empirical Review of Extant Literature

This section reviews the independent variables and their impact on the dependent variable. It discusses various kinds of literature related to the study.

2.3.1 SACCO Efficiency

A study by Andries (2010) was carried out to investigate bank efficiency determinants and productivity growth of the banking system in Central and Eastern Europe. Data of 112 banks were extracted from the National Bank's Annual Reports and also from Bankers Almanac Database and their scope period was five years. Through the use of Stochastic Frontier Analysis and Data Envelopment Analysis, it was deemed possible to examine efficiency. From the examination, they were able to identify various factors influencing the level of banks' efficiency which include the total assets, inflation rate, and capital structure.

In China, a study was done by Yao and Han (2007) to analyze fifteen large commercial banks based on their efficiency levels between the years 1998 to 2005 while making use of the parametric approach. From the results, the Chinese Commercial Banks lack differences in the substantial approach in relation to technical efficiency. Despite their high levels of average efficiency scores, the aggregate gap in technical efficiency was found to be as allow as 15% only. Moreover, the results further showed how the Big Four banks in China were able to improve total factor productivity by not only putting less focus on technological progress but also by mainly improving technical efficiency.

2.3.2 Cost of Credit in SACCOs

In Kenya, when the cost of credit is high, there will impede credit access by the customers in various credit facilities. Thus, as per the Central Bank of Kenya (2012), people have sourced cheaper forms of credit from the investment groups, SACCOs, and shylocks. Moreover, when opening a savings account, they are more attracted to the deposit rates that are offered.

The Regional Program on Enterprise Development (RPED) studies manufacturing firms in Kenya and they are characterized by a high proportion of small-sized activities. They also specified sectors like SME in how they carry out activities within the country while facing constraints due to lack of access to financial services. They also cited that cost of credit is correlated with the element of affordability and is regarded as one of the major obstacles faced in the SME sector.

Furthermore, a link was discovered between credit accessibility and the financial performance of small-scale enterprises.

2.3.3 SACCO efficiency and Cost of Credit

According to the World Bank (2010), financial institutions relied on the customers' credit reports offered by the Credit Reference Bureau to make a decision based on lending. The credit report and information sharing were yet to be significant, thus, the available information was not adequate to make lending. The time of the study was not reliable as both the credit reporting and information asymmetry were not as impactful as it is when the current study is doing its research. Coincidentally, Kenya's adoption of mobile banking led to the levels of non-performing loans to increase. However, information theory, which grounds mobile banking, states that the credit facilities' provision must be based on a credit assessment platform from the customers' screening as conveyed by Binnet, J. & Tellez, A. C. (2008).

2.3.4 Mediating effect of inflation on Sacco efficiency and cost of credit

Through the study by Ngele (2016) where he conducted a study to understand the effect of interest rates on borrowers' uptake of credit facilities in commercial banks in Kenya. The study utilized descriptive statistics and a multiple regression model was used and was carried out between the years 2005 to 2014. Moreover, the gathering of secondary data reviewed existing materials on the topic. The conclusions established that interest rates, level of deposits, and inflation are significant in the uptake of credit facilities, SACCO included. In relation to inflation, it was determined that it had a significant effect in justifying the variation in the borrower's uptake despite its effects were found to be negative. The correlation between interest rates and credit facilities was perceived to entail an inverse relationship and that the deposit volume has a positive relationship thus having a significant effect on the borrower's uptake determinants thus demonstrating the price of loanable funds have an elastic demand.

Imbuga (2014) did a study to determine the effects of inflation as a macroeconomic variable on loan repayment in commercial banks in the Kenyan banking system. By using the descriptive research design, they collected primary data for five years and had a sample size of 58 commercial banks in Kenya, 10 of which were listed in the Nairobi Securities Exchange (NSE). Through the use of Ordinary Least Squares (OLS) with a significant level of 5%, inflation was found to have positive significance with credit risk. Thus, the study recommended the bank managers employ a

more flexible approach when dealing with inflation. They can deal with it by increasing the provision of loan loss in the existence of high inflation and the period of low inflation, they are expected to decrease the loan loss provision.

2.4 Critique of the Literature

Credit is an important element that is required to evolve the financial institution from point A to point B. It was determined that each independent variable to be used in the current study have different relationships with the dependent variable. It was also discovered that various and interesting models of analysis were used for each study and were used as a reference for this paper. For deposit-taking SACCOs, they need to work more on the variables with positive associations to their operating system. Moreover, if they want better results, they need to find ways in which to enhance the aforementioned variables. Some of the studies were carried out in a different period upon which they had different working conditions in terms of the economic, social, and political environments. This issue can bring challenges when making inferences to the Kenyan setting.

2.5 Research Gap(s)

There are various studies that have been done on the impact of the efficiency of financial institutions on the cost of credit. From the various readings, it was discovered that the financial institution that was majorly used as an independent variable was the banking sector. From the statement, it was evident that there was a research gap in terms of the deposit-taking SACCOs thus this study came into play with the title, "The impact of efficiency of deposit-taking SACCOs on the cost of credit in Kenya." With the use of the research questions, this study will strive to respond and lessen the knowledge gap in this field of study.

Author(s)	Their study	The gaps	How the current study will fill the gaps
Andries (2010)	The Determinants of Bank Efficiency and Productivity in the Central and Eastern European Banking Systems	Only based their study under the banking sector	The research will be conducted under the deposit-taking SACCOs
Yao and Han (2007)	Ownership Reform Foreign Competition and Efficiency of Chinese Commercial Banks: A Non-Parametric Approach.	Their research was done in the early 2000s and used the non-parametric approach	Will use data from the recent past 5 years and use a panel data approach.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides the methods that were used to address the objectives and research problems. According to Kothari (2004), research methodology gives details regarding approaches and procedures used in conductivity studies. In chapter 3, most decisions about how the research was executed and how questionnaires were administered, as well as, when, where, and how the research was conducted are addressed. Specifically, the chapter includes the introduction, research philosophy, research design, population and sampling, data collection methods, data analysis, research quality, and ethical issues in research.

3.2 Research Philosophy

Philosophy can first be defined as the world being viewed under different ideologies and the process that operates within it. It is also concerned with the views about how the world works and as an academic subject, it primarily focuses on reality, knowledge, and existence. Ways in which one gains knowledge of the world affects one's perception of reality, and how you gain knowledge will affect the way in which you conduct the research in your dissertation. According to Berg (2004), the research philosophy refers to the beliefs, assumptions, and opinions that influence the way through which research studies are conducted. The philosophical approach is mainly focused on observations, which is then followed by a critical analysis through statistical methods. One of the philosophical approaches includes positivism which involves the use of sampling methodology to draw a representation of the area of study, after which the conclusive results are presented for generalization purposes. In assessing the current study, the positivist philosophical approach was practiced.

3.3 Research Design

Saunders et al (2012) documented that a research design is an outlined plan structure and strategy for conducting the research. This entails the provision of a blueprint to aid in selecting subjects of study, research targets, sites, and data gathering procedures to answer the set research questions. The researcher of the current study used the Correlation Research Design which aimed at determining the relationship between variables in a descriptive fashion. The guiding principle of the study is covered by the use of both quantitative and qualitative data to gain a deeper understanding and greater insightful interpretation of the results (Cooper & Schindler, 2014).

Quantitative data can be described as any quantifiable information that can be used for statistical analysis while qualitative data is data that can be observed and recorded; to mean the data can be collected through various methods such as interviews and observations. Also, quantitative data can make use of bar graphs and pie charts. Thus, the guiding principle is used in the study to investigate how the independent variables produce changes to the dependent variable.

3.4 Population and Sampling

A population is a complete set of units to be studied while a sample is a population subset (Kothari, 2004). The population of the current study is all the deposit-taking SACCOs which total 174 in total. This number was obtained from the SACCO Societies Act (Cap 490B) for the financial year ending December 2019. Mugenda and Mugenda (2003) suggested that 10% or more of a population is adequate for a study. Thus, a sample size of 42 deposit-taking SACCOs will be used which represents about 24% of the population. The sampling technique was simple random sampling and the technique used avoided any signs of bias.

The sample of SACCOs to total 42 was through a random selection of six deposit-taking SACCOs from the seven provinces of Kenya which include Nairobi, Central, Western, Nyanza, Coast, Eastern, and Rift Valley. Through research, it was discovered that there was no SACCO in the North Eastern province. The table below is a simplified version of the tables in appendix I which represents the list of deposit-taking SACCOs to be used in the study and the SACCO s were all chosen through the mentioned simple random sampling. Moreover, all the chosen SACCOs have complied with the regulations of SASRA 2019.

KENYAN PROVINCES	Sample
Nairobi	6
Rift Valley	6
Western	6
Nyanza	6
Central	6
Eastern	6
North Eastern	0

Coast	6
TOTAL	**42**

Table3.1 Simplified Sample Breakdown

3.5 Data Collection Methods

By 2019, SASRA had licensed around 174 deposit-taking SACCOs in the country, however, this study will make use of secondary data from a sampled number of SACCOs in the country. The data will be extracted from the audited financial statements for the year ended 31st December 2015 to 31st December 2019 which was considered to be suitable for the panel data analysis to be used. This also includes the use of statements of comprehensive income and statements of financial position. Data was also downloaded from The Kenya National Bureau of Statistics on the yearly inflation rates from 2015-2019. KUSCCO was also used to gather the required secondary data that may be required in the current study. All the data collected was used to investigate the relationship of the variables mentioned in the study topic. As stated by Tull & Hawkins (1993) that perception and beliefs will be sought to a five-point Likert Scale, five being the highest. As for the cost of credit, it is measured by calculating the difference between the ratio of financial expenses divided by bank debt and the countries' nominal short term interest rates. The bank debt is the summation of both long-term and short-term debts. The assets each deposit-taking SACCO acquires are in different sizes, to get an equal measurement of the assets to collect data to measure the firm size, we convert their total asset value to a log format. Competitiveness is also another control variable that will be measured by the use of the net asset value of the deposit-taking values while assuming that the higher the value of the asset, the higher the experienced competition. Furthermore, this study is using the correlation research design which means that the correlation coefficient will be used to measure the strength and direction of the relationship between the variables used in the study.

3.6 Data Analysis

3.6.1 Efficiency Measure Analysis

Unlike cost efficiency which is the ratio between non-performing loans of provision for loan loss and gross loans for DT-SACCOs, technical efficiency is more complex in that the researcher is required to use the Data Envelopment Analysis (DEA). The DEA model is based on simultaneous output expansion and input contraction and is used to determine a technical inefficiency calculation

for each of the DT-SACCOs sampled. According to Helfand & Levine (2004), Data envelopment analysis (DEA) is a linear programming mathematical technique used for calculating the relative efficiency of multi-input and multi-output decision-making units. DEA is one of the methods for determining the output level for quality standards. Moreover, Coelli (1995) proved DEA approach in estimating technical efficiency has two main advantages. First, it does not require the assumption of a functional form to specify the relationship between inputs and outputs. Second, it does not require the distributional assumption of the inefficiency term.

Mathematically, the technical inefficiency model is described by the equation below.

$TIE = DT(x, y; g_x, g_y) = \max \beta$ (1)

subject to:

$\sum_{t=1}^{T} \lambda_t \, y_{it} \geq y_{it} + \beta y_{it}$ i = 1,….., I (2)

$\sum_{t=1}^{T} \lambda_t \, x_{kt} \geq x_{kt} - \beta x_{kt}$ k = 1,…, K (3)

$\sum_{t=1}^{T} \lambda_t = 1$

$\lambda_t \geq 0$, t = 1,…, T

For DT-SACCOs t, the K inputs and I outputs are represented by the vectors x_{kt} for k =1,…, K inputs, and y_{it} for the outputs i = 1,…, I, respectively. Inputs are the signals or data that the system receives and outputs are signals or data that are transmitted from the system. In the case of the study, outputs used will be total revenue and loan to members while the inputs used will be operating costs and owners' equity and deposits. The frontier envelops the data points such that all observed points lie below or to the right of the frontier. The lambdas (λ) are weights used to construct the efficient frontier. They determine the point on the frontier where inefficient DT-SACCOs would be producing if they were efficient. Thus, by the weighted average of inputs and outputs for efficient DT-SACCOs at the frontier, the hypothetical value of maximum productivity for an inefficient DT-SACCO is determined. From the constraint in equation (1), the second one states that the i-th output of DT-SACCO t is increased by β to a no greater output level than the one generated with the weighted linear combination of efficient peers of DT-SACCO t. The next constraint states that the k-th input of DT-SACCO t is also reduced to the by β, note the negative sign, not less than the level of input of the weighted linear combination of effective peers

of the DT-SACCO. Maximizing β subject to both of these constraints brings DT-SACCO t to a hypothetical point on the surface of the production frontier. The $\sum_{t=1}^{T} \lambda_t = 1$ constraint relaxes the assumption that all DT-SACCOs are producing at an optimal scale. The $\lambda_t \geq 0$ constraint is a non-negativity constraint and ensures that none of the hypothetical points making up the frontier are in negative quadrants, that is both the DT-SACCOs' inputs and outputs need to be positive. β will satisfy $0 \leq \beta < \infty$ as a measure of technical inefficiency.

3.6.2 Regression Analysis

The regression model to be used below makes use of both types of variables, the dependent and independent variables, which are used in the correlation analysis to determine the relationship between the two types of variables. When the correlation is found to be zero, it means that there is no correlation between the variables, a negative correlation means an increase in one variable will lead to a decrease in the other variable whereas a positive correlation will mean an increase in one variable will lead to the other variable to also increase. This research study used panel data because it can detect and measure statistical effects that pure time-series and cross-sectional data cannot hence it is expected to give minimize estimation bias. Panel data regression analysis was used to estimate the impact of deposit-taking SACCO's efficiency on the cost of credit in Kenya. The panel data regression model took the following form: -

$$Y_{it} = \beta_0 + \beta_1 x_{1it} + \beta_2 x_{2it} + CONTROLS + \varepsilon_{it}$$

Y_{it}- Cost of credit of SACCO (i) for period (t)

β_0- The constant

β- The coefficient of the parameter

x_{1it} – The technical efficiency of SACCO (i) for the period (t)

x_{2it} – The cost efficiency of SACCO (i) for the period (t)

ε- The random error terms

t – A period of 5 years

i – number of deposits taking SACCOs

To determine the significance of the mediating variable, we look into the indirect effects of how significant the inflation rate is on the relationship between DT-SACCO efficiency and cost of credit in Kenya, and this can be done via the Structural Equation Modelling (SEM).

3.7 Research Quality

Boaz & Ashby (2003) stated that research quality encompasses all aspects of the study design. This means the methods pertaining to the judgment regarding the match between the methods, questions, and protection against systematic bias, nonsystematic bias, and inferential error. Principles and standards for quality research are commonly found in texts, reports, and guides to research design and methodology. The indicators of research quality are divided into two: extrinsic research quality which is connected with how the peer group will review the study and the other is intrinsic research quality which is dependent on how peers judge the research and the guidelines provided are informal. The quality of research is further embodied with how it answers the questions it addresses, and it should be a nontrivial extension of what is already known in the research community.

3.8 Ethical Issues in Research

These are rules of conduct that the researcher observes in any research. The researcher must comply with the research ethics to achieve the objective of the study. The researcher upheld ethical issues and gave respondents assurance that confidentiality was observed, and data collected was only used for research purposes. The study avoided asking personal questions that may invade the respondents' privacy.

CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION OF FINDINGS

4.1 Introduction

This chapter contains an analysis of the data collected and interpret the findings. These interpreted findings will help to understand the aim of the study which was to recognize the impact of the efficiency of DT-SACCOs on the Cost of Credit in Kenya. The study focused on the 42 DT-SACCOs as the sample size of the study. The results were analyzed by the use of STATA/SE 12.0 and R-Studio and the results will be shown in their relevant sectors.

4.2 Sample Representation

From the introduction above, the study made use of 42 DT-SACCOs to analyze the impact of Deposit-Taking SACCOs on the Cost of Credit in Kenya. There was a 100% response rate when collecting the data from all the 42 DT-SACCOs for the five years. The DT-SACCOs were randomly sampled from the 7 of 8 provinces in Kenya, the remaining province, North Eastern, did not have any DT-SACCO established within its borders. This process of random sampling provides a non-biased and simple analysis of how DT-SACCO efficiency is impacting the Cost of Credit in Kenya. In this study, the efficiency of the DT-SACCO will be determined through the technical and cost approaches. As a percentage of the most effective sample production unit, technical efficiency can be measured. In light of this study, to measure technical efficiency, we used the Data Envelopment Analysis (DEA) is an interesting tool for the analysis of technical efficiency. DEA is used to measure production efficiency and makes use of input and output parameters to assess which units are better compared to other units. In contrast, the DEA cannot be extended for economic efficiency due to a lack of prices in this study. But the absence of prices would not demonstrate how productive units may cut costs or increase the value of outputs by selecting different inputs or output combinations. The DEA shows how effectively inputs are used to generate outputs. Cost efficiency is generally the ratio between non-performing loans of provision for loan loss and gross loans for DT-SACCOs. To analyze how significant this variable is, the control variables, DT-SACCO size, and competition were used in a correlation analysis. Understanding the nexus between DT-SACCO efficiency and cost of credit, a panel data regression was used where the dependent variable was the cost of credit while the independent variables were technical efficiency and cost efficiency. The control variables were assumed to be independent variables while carrying out the regression.

4.3 Technical significance of DT-SACCOs

4.3.1 Technical efficiency significance on DT-SACCOs

For this study to be carried out, the used outputs were total revenue and loan to members while the inputs were operating costs and owners' equity and deposits. The table below shows a summarized output of these variables that will be used to test for technical efficiency.

	Outputs (Kes)		Inputs (Kes)	
	Total Revenue	Loan to members	Operating costs	Owner Equity
Min	-	-	-918,860,750.00	-38,553,741.00
1st Quarter	61,031,659.00	248,276,779.00	-5,293,892.00	1,117,944.00
Median	156,260,616.00	646,432,226.00	14,688,689.00	6,058,744.00
Mean	395,184,428.00	1,977,846,258.00	56,013,360.00	37,776,070.00
3rd Quarter	543,940,615.00	2,440,446,164.00	60,112,510.00	29,805,027.00
Max	2,420,705,756.00	13,932,744,226.00	1,482,663,693.00	677,289,764.00
Standard Deviation	503,365,960	2,805,900,753	216,789,239	93,131,011.82
Skewness	1.59	1.73	3.46	4.56
Kurtosis	3.22	4.55	14.24	23.85

Table 4.1 Summarized output

Mean is defined as the average of the values in each of the variables used while the median is the value separating the higher half from the lower half of a data sample. The first quarter (1st Quarter) is the middle number that falls between the smallest value of the dataset and the median while the first quarter (3rd Quarter) is the middle value between the median and the maximum value of the data set. The standard deviation is a measure of the dispersion of the data collected relative to its mean and it is calculated as the square root of the variance. The further the mean of the data point, the higher the deviation it is within the data set. Thus, the more spread out the data, the higher the standard deviation. The minimum value of a function is the lowest point of an apex and the maximum value of a function is the highest point of an apex.

For all the technical efficiency-related variables Skewness is used to calculate the degree of asymmetry, as shown above. As any skewness value is greater than 1, it shows that the distribution on the right side is fatter. The kurtosis, however, is about the distribution tails and provides further definitions of extreme values. The leptokurtic distribution for all the variables is because the values are more than 3. The distribution of this type has larger and fatter tails and can also be interpreted as having the profusion of outliers

Using the Data Envelopment Analysis (DEA), there were only four periods that exhibited full efficiency and these were Afya Sacco Society (2017, 2018, 2019) and Magadi Sacco Society (2016), moreover, these two SACCOs are also large in size. However, the remaining periods exhibited inefficiency in their operations. Having calculated the technical efficiency using the DEA, we can use the correlation analysis to know of its significance. Performing the correlation analysis, technical efficiency was positioned as the dependent variable while the control variables, DT-SACCO size, and competition, were the independent variable. The results are shown below;

	Teff	Logassets	Vnet
Teff	1.0000		
Logassets	0.1686	1.0000	
Vnet	0.3239	0.4255	1.0000

Table 4.2 Technical Efficiency correlation matrix table

From the table above, Teff represents technical efficiency, Logassets represents the log values of the total assets and Vnet represents the net values (which represents the competition).

The two independent variables, asset size and, competitiveness, were both found to have a positive correlation with technical efficiency at 0.1686 and 0.3239 respectively. This can be evaluated as the higher the two variables are, the higher the levels of technical efficiency. Since the levels of technical efficiency are high, the levels of operations in the DT-SACCOs will drop. The results of the positive correlation between technical efficiency and size of the SACCO were consistent with Rangan et al (1988) when the study aimed to look into the technical efficiency of a sample of the US banks. Moreover, the sampled DT-SACCOS had 52% of the average value of the inputs that were used to produce the same level of outputs. Moreover, from the correlation matrix table, it is noted that there was a positive correlation between the two control variables at 0.4255 to mean as one variable (Ceff) rises, the other (Logassets) will also rise.

4.3.2 Cost efficiency significance on DT-SACCOs

Through correlation analysis, the study made the cost efficient as the dependent variable while the controls were the independent variable.

	Ceff	Logassets	Vnet
Ceff	1.0000		
Logassets	-0.1437	1.0000	
Vnet	-0.0935	0.7044	1.0000

Table 4.3 Cost Efficiency correlation matrix table

From the table above, Ceff represents cost efficiency, Logassets represents the log values of the total assets and Vnet represents the net values (which represents the competition).

The two independent variables, asset size and, competitiveness, were both found to have a negative correlation with cost efficiency at -01437 and -0.0935 respectively. This can be evaluated as the higher the two variables are, the lower the levels of cost efficiency. Since the levels of cost efficiency are low, the levels of operations in the DT-SACCOs will rise. Thus, the findings were consistent with Karanja, J.N. (2013). However, from the correlation matrix table, it is noted that there was a positive correlation between the two control variables at 0.7044 to mean as one variable (Ceff) rises, the other (Logassets) will also rise.

4.4 Nexus between DT-SACCO efficiency and Cost of Credit in Kenya

Through the collected data that would be used to determine the nexus between DT-SACCO efficiency and Cost of Credit in Kenya, a random-effects model. The table below represents the results of the regression.

Number of obs	7
R-squared	0.1234

Coc	Coef	Std Err	z	P>|Z|	95% Conf. Interval	
Teff	505.27	104.74	4.82	0.0000	299.97	710.56
Ceff	-48,884.79	7,555.70	-6.47	0.0000	-63,693.70	-34,075.88
Logasset	-3,171.53	372.23	-8.52	0.0000	-3,901.07	-2,441.98
Vnet	0.000000414	0.0000001	4.14	0.0000	0.000000218	0.000000611
cons	73,782.13	8,567.93	8.61	0.0000	56,989.31	90,574.96

Random Effects Parameter	Estimates	Std. Error	95% Conf. Interval	
Sd (Residual)	63.3473	16.9303	37.5176	1069601

Table 4.4 Panel Data Regression Analysis

From the table above, the independent variables are Teff representing technical efficiency, Ceff representing cost efficiency. The controls were Logassets representing the log values of the total assets and Vnet representing the net values (which represents the competition). The dependent variable is the Coc which is the cost of credit in Kenya.

As shown by the results, there are seven observations that are inclusive of the constant variable. The coefficients will be used in the panel regression model expressed in chapter 3. The R-squared is 0.1234 as shown in the table above. This implies that the independent and control variables combined have a 12.34% effect on the Cost of Credit in Kenya.

In the regression table above, the alpha was 0.05 which was used against the 2-tailed p-values to test for significance. When the values of the p-values are less than the alpha, 0.05, then it is said to be statistically significant. According to the p-values in the table above, all the dependent variables were highly significant at a 5% significance level. Moreover, taking all variables at zero levels, the cost of credit will rise by 73,782.13. The confidence interval of 95% is very useful as the parameter's population value can be high and low. If 0 is within the confidence interval, the coefficient is statistically insignificant. As shown in Table 4.4, none of the variables used have a confidence interval that includes 0 and thus, all the variables are said to be statistically significant. Technical efficiency and competition were the only variables to have a positive effect on the cost of credit while the rest, cost efficiency and DT-SACCO size, had negative effects.

As stated above, a random-effects model was used because they estimate the effects of time-invariant variables. The random effects parameter table contains the calculated standard deviation of the residuals that represents the number of data points that have spread across the regression line. As shown in Table 4.4 above, 63.3473 is the estimated error value of predictability of the regression line. This can be further interpreted as a measure of 63.3473 represents how well the model predicts the dependent variable. The variable, Sd (Residual), is statistically significant because the confidence interval does not include 0 at an alpha of 0.05.

4.4.1 Cost of Credit and Technical Efficiency

From table 4.4, the researcher established a strong positive relationship between technical efficiency and the cost of credit at 505.27. This means that with an increase in technical efficiency by one level, the cost of credit will rise by 505.27. Thus, an increase in technical efficiency is achieved from producing the maximum outputs from a minimal amount of inputs and, having less to spend on inputs will have greater benefits on the cost of credit. This is beneficial as the funds that would have been used to purchase the excess inputs can be used to facilitate other activities within the DT-SACCOs.

4.4.2 Cost of Credit and Cost Efficiency

From table 4.4, the researcher established a strong negative relationship between cost efficiency and cost of credit of -48,884.79. This means that with an increase in cost efficiency by one level, the cost of credit will drop by 48,884.79. This means that the levels of cost efficiency dropped due to various factors, such as having cheaper maintenance costs, which will in, turn, enable the DT-SACCOs to save more thus having a negative impact on the cost of credit because there were no activities involving borrowing and debts.

4.4.3 Cost of Credit and DT-SACCO size

From table 4.4, the researcher established a strong negative relationship between the size of the DT-SACCO and the cost of credit of -3,171.53. This means that with an increase in the size of the DT-SACCO by one level, the cost of credit will drop by 3,171.53. So, the DT-SACCOs are not fully investing in their assets which in turn is diminishing the cost of credit within the country.

4.4.4 Cost of Credit and Competition

From table 4.4, the researcher established a weak positive relationship between the competitiveness of the DT-SACCO and the cost of credit of 0.000000414. This means that with an increase in competitiveness of the DT-SACCO by one level, the cost of credit will drop by 0.000000414. Therefore, the DT-SACCOs are fostering various strategies that are applied to improve their financial performance in ways to rival their contenders. No matter how small the levels of competition are, they will have a positive significant effect on the cost of credit in Kenya.

4.5 Intervening effect of the mediating variable

As stated in Chapter 3, the statistical operation used is the Structural Equation Modelling (SEM) that will help to determine the significance levels of the inflation rate. From this statistical

operation, the researcher managed to also get the direct and indirect effects of all the independent variables, the mediating variable and, the dependent variable. Despite the results having both direct and indirect effects, the current study was only interested in the indirect effects. The indirect effects show the influence of DT-SACCO efficiency on the cost of credit running through the inflation rate, as described in figure 2.1 in chapter two.

	Coef.	OIM Std. Err	z	P> |z|	95% Confidence Level	
ceff <-						
infrate2	0	(no path)				
Efficiency	-5.2830	(constrained)				
Control	0	(no path)				

Table 4.5 Summarized Table of the Indirect Effects

From the results, -5.2830 is the impact that the efficiency of DT-SACCO has on the cost of credit resulting from the mediating effect of the inflation rate. The coefficient of -5.2830 was constrained for better stability and generalization. From the coefficient, the researcher can define it as an increase in the mediation variable, inflation rate, by one will cause the impact of DT-SACCO efficiency on the cost of credit to decline by 5.2830.

In other words, the indirect effect of the inflation rate is not beneficial to the increase in the cost of credit in Kenya from the impact of DT-SACCO efficiency. The negative relationship is consistent with Ngele (2016) where the researcher stated that inflation rates had a negative significant effect in justifying the variation in the borrower's uptake.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

In this chapter, the researcher discusses the summary of results, conclusions that have been derived from the findings as shown and provides recommendations. The findings and suggestions are aimed at addressing the study objectives studied to assess the impact of the DT-SACCO efficiency on the cost of credit in Kenya. At the end of the study, the researcher also suggested potential areas to future researchers for further study.

5.2 Discussion of data analysis and findings interpretation

The final year audited financial statements of the sampled 42 DT-SACCOs were obtained and the five-year period was observable for all the sampled deposit-taking SACCOs. The analyzed data used descriptive analysis, correlation analysis and, panel data regression analysis to answer the research questions while using both STATA/SE 12.0 and R-Studio. The study established that Afya Sacco Society Ltd had more technical efficiency as compared to the other deposit-taking SACCOs. The average value of technical efficiency that the DT-SACCOs were operating at was 52%. Moreover, technical efficiency had a negative relationship with the operations of the DT-SACCOs. Cost efficiency also had a negative relationship with the operations of the DT-SACCOs but this is beneficial as the operations will rise unlike in technical efficiency where they will drop.

In terms of cost of credit, both technical efficiency and the control variable, competition, had a positive relationship of 505.27 and 0.000000414 respectively while cost efficiency and the control variable, DT-SACCO size, had negative relationships of -48,884.79 and -3,171.53 respectively. Furthermore, the stronger the relationship, the greater the impact it will have on the cost of credit in the country but a weaker relationship will have less significance unless actions are taken to enhance the relationships. The mediating variable, inflation rate, was found to have a negative significance of -5.2830 which is not beneficial as the cost of credit is reliant on the activities of DT-SACCOs when they operate efficiently.

5.3 Summary of results

The purpose of this study was to establish the impact of the efficiency of DT-SACCOs on the cost of credit in Kenya. So, what is the impact and, how does the mediating variable intervene with this

relationship? The researcher made use of descriptive analysis, correlation analysis, and panel data regression analysis. The secondary data used to perform the mentioned analyses was obtained from the published, final-year, audited financial statements filed with SASRA and, the inflation rates data was collected from KNBS. The population consisted of 174 DT-SACCOs licensed by SASRA as at 31st December 2019. A random sample of 42 DT-SACCOs was selected and all the financial statements were available for the five years required. Thus, this constituted a total observation of 210.

5.3.1 Objective 1: The level of efficiency of DT-SACCOS in Kenya.

The research found that the DT-SACCOs had an average technical rate of 52%, however, most of the DT-SACCOs were exhibiting technical inefficiency in their operations. Nevertheless, this fact, there was a positive correlation between technical efficiency and both the control variables, size, and competition, at 0.1686 and 0.3239 respectively. Unlike technical efficiency, cost efficiency had a negative correlation with both control variables, size, and competition, at -01437 and -0.0935 respectively. However, this was a positive outcome as this negative relationship is beneficial to the improvement of the operations within the DT-SACCOs.

5.3.2 Objective 2: The nexus between DT-SACCO efficiency and Cost of Credit.

The researcher established that each independent variable had a different relationship with the cost of credit, being the dependent variable. Both technical efficiency and competition, as a control variable, had a positive relationship with the cost of credit. The positive relationship is beneficial to the country as a rise in both the above-mentioned variables will raise the levels of cost of credit by 505.27 and 0.000000414 respectively. However, cots efficiency and DT-SACCO size, the other control variable, had the opposite effect. The negative relationship that they have could diminish the levels of cost of credit by 48,884.79 and 3,171.53 respectively. Thus, to curb this phenomenon, various strategies need to be applied to convert this relationship to a positive one that is beneficial to the cost of credit.

5.3.3 Objective 3: The Intervening effects of inflation rate on the relationship between DT-SACCO efficiency and Cost of Credit.

The researcher further found that the mediating variable had a negative intervening effect that can be disadvantageous to the relationship between the impactful nature of the efficiency of DT-SACCOs and the cost of credit. To be more precise, the negative influence that the mediating

variable had on the relationship was at -5.2830. Therefore, strategies need to be implemented to overcome this challenge despite the changes in inflation rates that will occur in the future.

5.4 Conclusion

In closure, the researcher determined that the cost of credit is jointly influenced by technical efficiency, cost efficiency, and both control variables, size, and competition. According to the p-values, all the independent variables were highly significant at a 5% significance level and they each had a different effect on the dependent variable, cost of credit. Both technical efficiency and competition had a positive relationship with the cost of credit, nevertheless, technical efficiency had a stronger relationship while that of competition was weak. Whereas, cost efficiency and DT-SACCO size had strong negative relationships with the dependent variable used in this study.

Furthermore, the mediating variable was found to have a negative intervening effect on the relationship between the independent and dependent variables. Thus, the researcher was able to meet the objectives of this study that was to assess the impact of the efficiency of deposit-taking SACCOs on the cost of credit in Kenya. Moreover, the findings of the research study were consistent with the theoretical and literature reviewed in chapter two of this study. The dependable theoretical and literature reviewed were from Rangan et al (1988), Karanja, J.N. (2013), and Ngele (2016).

5.5 Recommendation from the study

Many DT-SACCOs were found to be technically inefficient and thus, the researcher recommends that they should start implementing strategies that enable them to maximize their outputs with minimal inputs. The more their outputs are readily available, in this case, total revenue and loan to members, they can improve in enhancing the country's cost of credit. Moreover, it can be advisable for the smaller DT-SACCOs to merge to form bigger DT-SACCOs to gain a more optimal outcome and be able to take advantage of their bigger size and resulting in economies of scale. In simplified terms, the larger-merged companies will have more savings from their costs and their production levels will be higher.

The researcher would also like to recommend the DT-SACCOs invest more in their assets which in turn will help to enhance the cost of credit. Various ways the DT-SACCOs can invest their assets is by improving on their customer satisfaction policies and by carefully reducing the operation costs by, for example, hiring freelancers who can perform the job with more quality and

have an affordable fee charge as compared to normal employees and also, this is more beneficial to the overall savings of the mentioned financial institutions.

Competition was found to have a weak and positive effect on the cost of credit in Kenya. Thus, the researcher would recommend the DT-SACCOs to try to incorporate various market forces in their strategies to raise their competition levels among their rivals. Some of the market forces that can be looked into are the customers' responsiveness and being able to expand information and make it readily available on a timely basis.

DT-SACCOs need to inform people of the cost of credit to enable researchers to know the cap each DT-SACCO is using. The cost of credit having a cap will improve the morality of all DT-SACCOs in general and enhance their economic intelligence by denying permission for lenders to target those on lower incomes with a very high-interest rate for the purpose of extracting large profits.

5.6 Limitations of the study

There were a number of limitations from the research study that can be cited. To begin with, the researcher only limited the use of two inputs and outputs when measuring the technical efficiency of the sampled DT-SACCOs.

Other researchers, such as Shamshur, A. & Weill, L. (2019), made use of the actual cost of credit values when looking into the influence of bank efficiency on the cost of credit. However, the current study was unfortunate as the cost of credit values used was calculated which does not give the appropriate results. What the calculated cost of credit does is provide an average view of the sampled DT-SACCOs that are being analyzed and not giving the bias standpoint of the cost of credit that each sampled DT-SACCO is using in their operations. So, using the calculated cost of credit is covering this fact.

While collecting the data, it was noted that there was no uniformity in the classification of the accounting items and the classifications were based on the subjective decisions on the individual basis of the sampled DT-SACCOs. In some cases, financial expenses were treated as administrative expenses, and total revenue was mentioned in some of the audited financial statements but in others, it had to be calculated from the accounting ratios. In regards to the accounting ratios, Ikhide (2000) stated that there is a setback in using methods based on accounting

ratios in that the difference in capital structure, business mix, and accounting standards across firms may affect these ratios and render comparability inadequate.

5.7 Suggestions for further research

The aim of this study was to look into the impact of the efficiency of DT-SACCO on the cost of credit in Kenya. This research can be improved by testing other variables that have a relation to the efficiency of DT-SACCOs such as profit efficiency and revenue efficiency.

In the future, this research study can be replicated through the use of the actual cost of credit value when the government applies a policy on the DT-SACCOs to cap their cost of credit as is in the recommendation. Moreover, one can look into the difference between the actual and calculated cost of credit. If a difference is established in the results, one can look into the reasons for their being such a difference and which variables are causing the difference to arise between the actual and calculated cost of credit.

Furthermore, this study used the interest on the loan product to calculate the cost of credit, nevertheless, future researchers can use other charges to perform the same calculations and also can make use of other control variables such as age and other macroeconomic control variables.

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APPENDICES

Appendix 1: List of DT saccos in the sample

No.	Nairobi	Postal Address
1.	Afya Sacco Society Ltd	P.O. Box 11607 – 00400, Nairobi.
2.	Magereza Sacco Society Ltd	P.O. Box 53131 – 00200, Nairobi
3.	Tembo Sacco Society Ltd	P.O. Box 91 – 00618, Ruaraka Nairobi
4.	Ukulima Saco Society Ltd	P.O. Box 44071 – 00100, Nairobi.
5.	Wanandege Sacco Society Ltd	P.O. Box 19074 – 00501, Nairobi
6.	Waumini Sacco Society Ltd	P.O. Box 66121 – 00800, Nairobi

No.	Central	Postal Address
1.	2NK Sacco Society Ltd	P.O Box 12196 – 10109, Nyeri
2.	Biashara Sacco Society Ltd	P.O. Box 1895 – 10100, Nyeri.
3.	Dimkes Sacco Society Ltd	P.O. Box 886 – 00900, Kiambu
4.	Enea Sacco Society Ltd	P.O. Box 1836 – 10101, Karatina
5.	K-Unity Sacco Society Ltd	P.O. Box 268 – 00900, Kiambu
6.	Taifa Sacco Society Ltd	P.O. Box 1649 – 10100, Nyeri.

No.	Western	Postal Address
1.	Faridi Sacco Society Ltd	P.O. Box 448 – 50400, Busia
2.	IG Sacco Society Ltd	P.O. Box 1150 –50100, Kakamega.
3.	Taraji Sacco Society Ltd	P.O. Box 605 – 40600, Siaya.
4.	Ng'arisha Sacco Society Ltd	P.O. Box 1199 – 50200, Bungoma
5.	Wevarsity Sacco Society Ltd	P.O Box 873 – 50100, Kakamega

6.	Vihiga County Farmers Sacco Society Ltd	P.O Box 309 – 50317, Chavakali

No.	Eastern	Postal Address
1.	Capital Sacco Society Ltd	P.O Box 1479 – 60200, Meru.
2.	Centenary Sacco Society Ltd	P.O. Box 1207 – 60200, Meru.
3.	Daima Sacco Society Ltd	P.O. Box 2032 – 60100, Embu.
4.	Dhabiti Sacco Society Ltd	P.O. Box 353 – 60600, Maua.
5.	Imenti Sacco Society Ltd	P.O. Box 3192 – 60200, Meru
6.	Solution Sacco Society Ltd	P.O. Box 1694 – 60200, Meru

No.	Rift Valley	Postal Address
1.	Egerton Sacco Society Ltd	P.O. Box 178 – 20115, Egerton
2.	Imarisha Sacco Society Ltd	P.O. Box 682 – 20200, Kericho.
3.	Magadi Sacco Society Ltd	P.O. Box 13 – 00205, Magadi
4.	Muki Sacco Society Ltd	P.O Box 398 – 20318, North Kinangop
5.	Ndege Chai Sacco Society Ltd	P.O. Box 857 – 20200, Kericho
6.	Thamani Sacco Society Ltd	P.O. Box 467 – 60400, Chuka.

No.	Nyanza	Postal Address
1.	Gusii Mwalimu Sacco Society Ltd	P.O. Box 1335 – 40200, Kisii
2.	Kenya Achievas Sacco Society Ltd	P.O. Box 3080 – 40200, Kisii.
3.	Kite Sacco Society Ltd	P.O. Box 2073 – 40100, Kisumu.
4.	Koru Sacco Society Ltd	P.O. Box Private Bag-40100, Koru
5.	Nyamira Sacco Society Ltd	P.O. Box 633 – 40500, Nyamira

6.	Wakenya Pamoja Sacco Society Ltd	P.O. Box 829 – 40200, Kisii

No.	Coast	Postal Address
1.	Bandari Sacco Society Ltd	P.O. Box 95011 – 80104, Mombasa
2.	Imarika Sacco Society Ltd	P.O. Box 7 12 – 80108, Kilifi.
3.	KMFRI Sacco Society Ltd	P.O. Box 80862 – 80100, Mombasa
4.	Lengo Sacco Society Ltd	P.O. Box 1005 – 80200, Malindi.
5.	Mafanikio Sacco Society Ltd	P.O Box 86515 – 80100, Mombasa.
6.	Mombasa Port Sacco Society Ltd	P.O. Box 95372 – 80104, Mombasa

Appendix 2: TurnItIn Score

impact of sacco efficiency on the CoC in Kenya

ORIGINALITY REPORT

21%	18%	4%	12%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

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3	ageconsearch.umn.edu Internet Source	1%
4	Submitted to Strathmore University Student Paper	1%
5	www.coursehero.com Internet Source	1%