# IMPACT OF AGENCY BANKING ON THE OPERATIONAL EFFICIENCY OF SAVINGS AND CREDIT CO-OPERATIVE SOCIETIES IN KIAMBU COUNTY, KENYA

**By**

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## DECLARATION

I, the undersigned, declare that this project is my original work and has not been submitted for a degree or any other qualification at this University or any other institution of higher learning.

Signed …….. Date……

**Mwaura Mitchelle Wangari**

This research project has been submitted for examination with my approval as the appointed supervisor.

Signed…….. Date……..

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Supervisor

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# DEDICATION

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## LIST OF ACRONYMS AND ABBREVIATIONS

| | | |
|---|---|---|
| **ATM's** | - | Auto Teller Machines |
| **AFI** | - | Alliance for Financial Inclusion |
| **DEA** | - | Data Envelopment Analysis |
| **MFI's** | - | Microfinance Institutions |
| **POS** | - | Point of Sale |
| **ROA** | - | Return on Assets |
| **ROI** | - | Return on Investment |
| **SACCO's** | - | Saving and Credit Co-operative Societies |
| **SARSA** | - | Sacco Societies Regulatory Authority |
| **SME's** | - | Small and Medium Enterprises |

# ABSTRACT

The Kenyan banking sector is relatively developed and comprises of several commercial banks, numerous insurance companies, a stock exchange system and credit unions including the savings and credit cooperative societies. The recent reforms in the Sacco industry revolutionized the type and quality of products and services delivered to customers by cooperative societies with the organizations adopting agency baking systems within their operations. I estimated the potential impact of agency banking on the operational efficiency of Saccos in Kiambu County.

The study adopted the descriptive data technique where data was collected without manipulating the research environment. The target population comprised of 39 branches across 8 registered deposit taking Sacco's in Kiambu County that have adopted agency banking systems. The study utilized secondary data collected from the Sacco Regulatory Authority supervision reports and audited financial statements as well as annual reports for the Saccos. The reports were analyzed for a period of 3 years, between 2015 and 2017. The study used census to select the participants for purposes of accuracy. The study incorporated secondary data with the data obtained being analyzed using the Data Envelopment Analysis (DEA).

The study sought to establish the impact of agency banking of the operational efficiency of Saccos in Kiambu County and therefore focused on five variables which included the agency banking products provided by Saccos, agency bank staff, the location of agent banks, the operating hours and liquidity which had a varied contribution to each factor of operational efficiency i.e. customer retention, profits gained and the rate of cost recovery of Saccos within Kiambu County. The study concluded that the factors of agency banking including the products and services of agent banks, location, the agent staff number and characteristics, their operating hours and the Sacco agent liquidity ratio have a significant influence on the operational efficiency of Saccos in Kiambu County.The study recommended that the provision of frontline services to customers should be improved, Saccos ought to increase the number of agent banks so as to reach more customers and employ a sufficient number of trained agent staff to provide the necessary products and services to a wide range of customers.

# CHAPTER ONE: INTRODUCTION

## 1.1. Background of the Study

According to the United Nations Economic Commission for Africa (UNECA, 2003), the Kenyan banking sector is relatively developed and comprises of several commercial banks, numerous insurance companies, a stock exchange system and credit unions including the savings and credit cooperative societies. These financial institutions affect, facilitate and integrate economic endeavors such as the mobilization of resources, alleviation of poverty and the distribution of public finances (Dzombo, Kilika&Maingi, 2017). This is done through the use of technological advancements including internet and mobile banking as well as agency banking. Agency banking entails the form of branchless banking where financial institutions including Saccos employ the use of digital innovation such as point of sale (POS) to distribute financial products and services to various market segments. This distribution strategy is hinged on the theory of agency banking that establishes a relationship between banks and agents for purposes of performing banking services on each other's behalf. The branchless banking theory allows agent banks or outlets to provide financial products to consumers.

Operational efficiency focuses on the how firms are able to mitigate risks and maximize the utilization of resources with an aim of delivering quality products and services to consumers. According to Ndolo (2015), operation efficiency relies on factors such as technological progression, return to scale, supply chain control and the skills and knowledge of workers. The common theories applied to the understanding of operational efficiency include the theories of operational excellence and the contingency theory. When firms achieve operational efficiency, they are considered as profitable and productive hence

studies have been conducted to evaluate the factors that influence such achievements. As a result, questions may arise whether agency banking can influence the operational efficiency of organizations that partially or fully rely on their existence including credit unions. This research seeks to evaluate the impact of agency banking on the operational efficiency of Sacco's in Kiambu County, Kenya.

### 1.1.1. Agency Banking

Agency banking can be defined as the provision of financial products and services to individual and corporate clients by use of independent retail outlets or agents. These outlets depend on mobile based technological innovations such as the point of sale (POS) device and mobile phones to provide real time transactions of funds (Mary, 2014). Globally, the development and use of agency banking was aimed at facilitating and enhancing the access to banking services for the impoverished low income person's and small microenterprises (SME's). These segments form the extensive segment of consumers that have been ignored and underserved by major financial institutions.

Agency banking within credit unions particularly Saccos entails providing financial services to members through non-bank agent including grocery shops, post offices and pharmacies (AFI, 2012). This model enables Sacco's to expand their scope of service delivery especially in areas they lack sufficient capacity to penetrate or establish a formal branch. According to Juma (2010), firms including Saccos' lined up for agency banking after the CBK set the rules for engagement about a decade ago. Since the organizations enjoy a widespread presence in urban and rural settings and draw their membership from

the middle class who represent a significant deposit base, agency banking provided them with the much needed platform to tap into emergent markets to finance their lending business. Despite a number of Sacco's investing in point of sale terminals (PoS) to facilitate agency banking they still have to rely on commercial bank platforms.

Banking services are nowadays not limited to traditional bank facilities. This transformation had facilitated the entry of non-bank institutions that focus on offering financial services and products that rely on mobile wallets and loan products. Agency banking is among these non-bank facilities that have played a pivotal role in enhancing financial inclusion. According to Finacle (2012), financial inclusion is the convergence of both bank and non-bank institutions such as agent-banks to provide financial services at a relatively lower cost, improved convenience and a greater geographical reach to unbanked populations. Therefore, agency banking inspires financial inclusion by opening a number of opportunities for financial organizations such as credit unions. This is achieved through partnerships between agent banks that provide financial transactions.

There are different agency banking models adopted in countries across the world which affect the success of such systems in terms of reliability, accessibility and influence on the overall banking sector (Oxford Policy Management, 2011). Based on a critical evaluation of the agency banking concepts adopted in Columbia, Nigeria, Peru and Kenya, agency banking has been adopted in different ways with respect to non-bank entities utilized, regulating body, approved activities and the minimum standards. Agency banking can be measured by the proportion of Sacco members in Kiambu County that have access to

affordable, convenient, and efficiently delivered formal financial products and services (Kunt&Klapper, 2015). Furthermore, the concept can be assessed based on the impact of the tailored services offered by bank led agents to underserved consumer segments including composition of agency staff, cash liquidity, proximity to clients, security and cost of transactions, and flexibility in operating hours.

### 1.1.2. Operational Efficiency

Operational efficiency refers to the ability to deliver products and services to consumers cost effectively without having to compromise on quality. According to Kim et al. (2016), operational efficiency is centered on the costs of transactions as compared to the investments. An operationally efficient organization or market operates when the prevailing conditions enable participants to conduct business and generate revenue at a price that is fairly equated to the actual costs that are required to provide them. Therefore, the efficiency of organizations is a product of specific factors including controlling costs, technological innovation and management skills. Efficiency is usually associated with how well a given action is undertaken hence one can measure the aspect as a ratio of observed productivity against maximum productivity (Lee & Johnson, 2015). The maximum levels of productivity serve as a benchmark for the desired platform. One can measure operational efficiency using various ratios or metrics that indicate an organization's productivity, profitability, economic situation and the rate of cost-recovery.

Operational efficiency occurs when organizations have the right combination of personnel, business process and technological advancements that come together to improve

productivity and the value of any give business operation. These outcomes should be achieved while driving the costs associated with the routine operations to the targeted level (Ndolo, 2015). This study conceptualizes operational efficiency as the profitable, legal and efficient use of limited resources in perfect consonance with the financial policies that are laid down for a given business operation. Additionally, the concept signifies the degree of success and quality of skill that are attained in the performance and management of various activities within an enterprise. Therefore, operational efficiency is further perceived as the outcomes that firms achieve as a result of the constructions of chain activities as well as the quality of the performances across time. In context, operational efficiency is related to the distinct strategies and techniques that are applied to achieve a certain the goal of delivering quality products and services to consumers in the most efficient and timely manner (Ishmael &Nondi, 2017).

There are several metrics used to measure operational efficiency which include Fixed-Asset Turnover (FAT) and Equity Turnover (ET). The Total Asset Turnover ratio measures a company's ability to generate sales based on the investments in total assets. The FAT is usually obtained by dividing the net sales by the average net fixed assets. The Equity turnover is a metric that measures the capability of a company to generate sales given the investments in the total equity. However, operational efficiency can be measured using key performance indicators that are specific to a given company or industry (Gitau, 2014). In this case, the operational performance of credit unions particularly Sacco's is important as it contributes to the operation and overall growth of the economy through various functions including being a financial intermediary while facilitating the settlement of payments.

Therefore the metrics used to measure the operational performance of credit unions include the volume of customer transactions, consumer base or market share and profitability, rate of cost recovery.

### 1.1.3. Agency Banking and Operational Efficiency

Agency banking is the concept where financial institutions including banks appoint external business persons and entities to provide a variety of banking services to populations that lack access to the conventional banking systems (Ndegwa, 2017). The integration of information and communication technologies such as point of sale devices and non-bank retail agents to capture the financially excluded market segments is the foundation and institutional arrangements behind the widespread use of agency banking models. Numerous studies indicate the impact of agency banking of the operational efficiency of the financial institutions especially commercial banks. However, there are limited studies on the adoption of agency banking among Saccos. Based on case selection, there are various Sacco's in Kiambu County that have adopted agency baking including K-Unity Sacco Limited and Metropolitan Teachers Sacco Ltd. Others include Dimkes Sacco and Urithi Housing Cooperative Society that have embraced agency banking as a means of expanding their reach in the region and beyond (Okoth, 2017). By diverting a massive number of customers from overcrowded branches, agent banks provide a complementary and more convenient method for reaching the unbanked client segment and an additional geographic cover. Therefore, banks are able to cut costs on setting physical branches and hiring human resources while providing a convenient access to banking services with extended hours using bank led agents.

Operational efficiency is among the underlying and basic strategic goals of any given business entity. According to Lee & Johnson (2015), operational efficiency relates to the ability of firms to deliver goods and products to consumers at the least cost while maintaining the highest quality. Therefore, credit unions including cooperative societies that are operationally efficient ought to possess the capacity to effectively utilize inputs to produce the desired output, use the right mix of inputs to produce the right output at the prevailing prices, respond to price changes for given input, improve productivity over time and be able to scale their operations.

Credit unions represent a type of financial cooperative where members pool their funds to buy shares thus having access to lines of credit, create deposit accounts and other financial services that are offered (Wheelock & Wilson, 2011). Across the globe, credit unions offer similar services as compared to commercial banks but differ in structural functions where banks operate to generate profits for shareholders while the cooperative unions operate as non-profit firms that are designed to serve their members who happen to be the de facto owners or principal shareholders. As a result, assessing how agency banking impacts the operations of credit unions provides a dynamic angle as to whether these institutions become operationally efficient when utilizing the agency bank model.

### 1.1.4. Savings and Credit Cooperatives Societies in Kiambu County

Savings and Credit Cooperative (Sacco) Societies are formal organizations that enable members to make collective efforts in order to achieve common goals on both voluntary and democratic terms. According to Mwangi&Wambua (2016), these co-operative

societies have a similar objective; that is to pool financial resources in the form of savings for memberships and in turn offer them with lines of credits. Furthermore, Sacco's encourage members to manage their finances properly and invest wisely in income generating activities. Sacco's in Kenya are licensed to undertake deposit-taking services. In the County of Kiambu, Sacco's are regulated and managed by the Directorate of Cooperative Development that is under the Ministry of Trade, Industry, Tourism and Co-operative Development. There are almost 15 licensed deposit-taking cooperative societies operating in Kiambu County with several branches spread across the county (Appendix IV). According to Wanjiru& Willy (2016), this total is an increase from the 12 licensed Sacco Societies that had met the minimum licensing requirements by the close of the transition period ending June 2014. The native Sacco's in the county include UrithiHousing Cooperative, Dimkes Sacco Society and K-unity Sacco Society (Sacco Societies Regulatory Authority, 2016).

The recent reforms in the Sacco industry revolutionized the type and quality of products and services delivered to customers by cooperative societies. Sacco's have focused on improving their performance in fiscal terms by adopting various practices that integrate access to affordable and reliable financial services. However, the adoption of agency banking models by credit unions in Kiambu and the country at large has been an area of concern with only a handful of the having adopted the practice within their business operations. In 2014, Stima Sacco entered into a partnership with Family Bank Kenya to provide banking services such as funds transfer and deposits to its members in any of the 78 Family branches and agent outlets located across the country (Ngigi, 2014). These

services were also extended to Stima Sacco branches and members residing in Kiambu County with other credit unions expected to follow suit. However, the adoption has been relatively slow as the agency banking model continues to take shape in the financial sector. This element has greatly influenced the ability of Sacco's to provide financial services to the severely ignored market segments thus limiting the sector's operational efficiency in terms of customer base, market penetration and widespread mobilization of financial resources.

## 1.2. Research Problem

Operational efficiency measures an organization's ability to perform its primary roles, generate revenue and regulate costs. Several studies have been directed towards how agency banking affects operational efficiency of contemporary banking facilities and other financial institutions with minimal focus given to the possible factors that could affect the operational efficiency of credit unions particularly cooperative societies. From a global perspective there are various studies that indicate the link between agency banking and the operational efficiency of banking facilities. A study by McKinley &Banaian (2005) on the operational efficiency of central banks reveals that such institutions play the role of ensuring monetary stability thus should be efficient at any given time. The findings by Gillet et al. (2014) revealed that operational efficiency is related to the financial performance of manufacturing firms in India. Therefore, an increase in the operational efficiency is likely to influence the future performance of any given firm. In their study, Christopolous, Farias& Marques (2015) agree that branchless or agency banking enables the expansion of financial services to remote and access by the economically challenged

thus improving the operational efficiency of bank correspondents. Additionally, the technological advancements and operational viability offered by agent banks enables commercial banks to improve service delivery and reach a wider market composed of the unbanked population (Chiteli, 2013).

In Kenya, a majority of the studies focus on the influence of agency banking on the performance of commercial banks. Currently, Sacco's relate their operational efficiency to the growth in customer deposits, the affordability of loans, growth in membership and market share and the availability of innovative loans. By improving the level of operational performance, Sacco's have the opportunity to compete effectively with commercial banks and achieve to the highest degree of profitability, market dominance and cost-effectiveness. Gitau (2014) studied the impact of agency banking on the operational performance of selected banks in Kenya. Based on the outcomes of the study, it is evident that banking agents improve the operational performance of financial institutions by reducing operating costs, increasing the number or customer transactions and offering convenience in terms of location and operating hours. Kanyore (2017) acknowledges that the services provided by agent banks enable banking institutions to enhance consumer access to financial services thus resulting in improved financial performance. However, there is no substantial research evidence indicating the influence of the adoption of agency banking on the efficiency of credit societies (Sacco's).

Furthermore, Sacco Societies have a primary function in the financial sector which entails acting as financial intermediaries to ensure the enhanced access to financial resources by a majority of the unbanked or rural market segments. These financial institutions have

realized the potential of agency banking in their quest to provide Front Office Services Activity (FOSA). According to a review of Sacco societies in Kenya, these financial institutions rely on commercial banks to provide quasi-banking services despite investing in the POS terminals.

Therefore, agency banking is critical player in the expansion of the banking sector towards unbanked populations in Kiambu County hence the need to evaluate its impact on the operational performance of Sacco's. Despite the perceived correlation between agency banking and the performance of credit unions, there are no published academic studies that have been conducted to determine the influence of agency banking on the operational efficiency of cooperative societies. Fundamentally, there is a gap in literature describing how agency banking systems have impacted the overall performance of Sacco's. Therefore, the study is aimed at answering the question; what is the impact of agency banking on the operational efficiency of savings and credit cooperative (Sacco) societies?

## 1.3. Research Objective

The aim of this study is to determine how agency banking impacts the operational efficiency of Sacco's in the County of Kiambu.

## 1.4. Value of the Study

The findings from the study will assist current and potential shareholders in the Sacco industry to make informed decisions. Insight on how agency banking influences the operational efficiency of cooperative societies will assist in the accurate valuation of these

institutions and the wider banking sector.

The outcomes of this research will assist the government and policy makers to develop policies that focus on integrating cooperative societies into the formal banking sector with emphasis on the adoption of agency banking system. The findings will provide a better understanding of how agency banking affects the operational efficiency of Sacco's thus provide possible policies that will improve the interaction of both financial systems.

Furthermore, the study will help management teams in the Sacco's to understand the relationship between decentralized systems such as agency banking and the operational efficiency of cooperative societies. This will help better understand the influence of agency banking systems on the profitability, consumer base of credit unions in terms of efficiency.

# CHAPTER TWO: LITERATURE REVIEW

## 2.1. Introduction

This section provides an analysis of the existing literature and theoretical frameworks relating to agency banking and operational efficiency. The section starts by providing a theoretical review of agency banking and then proceeds to analyze the determinants of operational efficiency. The final part involves a critique of empirical studies.

## 2.2. Theoretical Review

### 2.2.1. Agency Banking Theory

The theory of agency banking is founded on the theory of distribution channels in marketing and the theory of finance. According to Bizah, Gumbo &Magweva (2017), agency banking relies on the relationship between a bank (principal) and a business person (agent) where the latter performs banking services on behalf of the principal who delegated the decision making authority. Under the agency, banks contract third parties especially retail outlets such as shops to provide financial services to a majority of the unbanked population. The marketing theory of distribution channels relates to agency banking with the contracted retailers acting as the much needed intermediaries for banks to get their products and services to the existing and emerging consumer markets. In context, the agency banking strategy has enabled financial institutions to avail low value mass market financial commodities to low income and disadvantaged consumers whose value and volume and transactions are considered as low. Chaia et al (2010) report that agency banking theories of finance and marketing distribution channels allow banks and financial

institutions to serve underserved populations at the lower costs without having to set up physical branches.

As a result, bank led agents operate in remote or sparsely populated areas thus enabling banks to cover a wider geographical coverage. Furthermore, agency banking systems minimize fixed costs hence reducing the costs transactions and lower the cost of acquisition when compared to traditional banking methods (Jayanty, 2012). Therefore, the agency banking model contributes to the development of the independent variables including access to financial services, liquidity, cost of transactions, geographical coverage and convenience of location and operating hours. Under enhanced access to financial services, the agency banking theory proposes the delivery of financial products to the doorstep of those who are unable or reluctant to visit the nearest banking facility. Additionally, the agent theory offers a structure where consumers enjoy flexible operating hours which ensure that most people are able to access financial services outside the traditional banking hours. Liquidity structures in agent banking ensure the availability and convertibility of cash for customers. According to Ouma (2013), agency banking is poised to enable both financial and non-financial institutions to provide financial services to consumers in a more financially savvy and less expensive way.

### 2.2.2. Branchless Banking Theory

The theory focuses on how branchless banking with respect to agent banks is conducted and the risks as well as opportunities derived from the practice hence contributing to the development of some of the independent variables. These variables include cash liquidity

and flexibility in operational hours. Within the theory of branchless banking, licensed agent banks are allowed to distribute financial products and services to consumers through a retail agent or store (Dzombo, Kilika&Maingi, 2017). Therefore, agency banking systems entail the development of financial based commodities and distributing them through retail agents who are tasked with handling most of the customer interactions. These agents ensure they have the recommended level of cash liquidity to provide deposit and withdrawal services to individuals who are underserved or out of reach for the banking sector. Furthermore, customers deal with non-bank firms that rely on a mobile network operator and provide financial services outside the normal banking hours.

### 2.2.3. Theory of Operational Excellence

Operational excellence refers to the designing and management of business activities that maximize the profitability through the continued operation of efficient production and delivery of products and services to consumers at the right value (Allen, 2011). In theory, the operational efficiency of any given firm is hinged on the ability of the entity to operate at the highest level of performance hence reaching the peak of business performance. However, operational performance does not only focus on the performance in terms of cost effectiveness, time, and quality as well as the metrics of flexibility. According to Wahab, Ismail &Muhayiddin (2016), an organization's operational efficiency should also support its overall growth in terms of handling human and capital resources efficiently. Therefore, operational excellence emphasizes on reaching the highest level of efficiency by doing things faster, better and cheaper.

This approach supports the development of the dependent variables which relate to credit

unions particularly Sacco Societies. These variables include the outcomes on the volume of customer transactions, customer retention and satisfaction, profitability and resource mobilization. Traditionally, achieving operational excellence entails optimizing company processes such as production to satisfy consumer demands, improve quality and maximize efficiency and productivity. Therefore, organizations with excellent operating systems possess the ability to achieve world class performance in terms of providing quality services to its consumer base, maximizing profitability and ensuring the highest level of customer transactions (Allen, 2011). These variables among others are founded on the systematic approach of the theory of operational excellence that proposes the continuous pursuit by organizations to improve culture, maintain excellent service and customer orientation while ensuring customer satisfaction and efficiency.

### 2.2.4. Contingency Theory

The contingency theory is based on the understanding that one element is dependent on other elements. Therefore, businesses that need to be efficient ought to create the perfect fit between their organizational structure and the prevailing conditions within the external environment (Ishamel&Ndondi, 2017). As a result, the appropriate management approach or adoption of a technological innovation is contingent on the situation of the firm. The contingency theory provides a rich blend of the organizational theory and the organizational structure. In context, organizations can be shaped by contingency measures to avoid loss of operational efficiency or performance. Furthermore, the theory is based on the premise that there is no standard measurement system which applies equally to different organizations under varied circumstances. Within the contingency theory, the theoretical

perspectives usually emphasize how contextual factors such as firm size, technological advancement and overall strategy affect the structural design and functioning of organizations. These contextual factors in this case refer to the structural and operating characteristics of agency banking models while the functioning aspect translates to the operational efficiency of credit unions. This theory is relevant to study because the dependent variables rely on the independent and control variables hence the determination of the impact of agency banking on the operational efficiency of credit unions.

## 2.3. Determinants of Operational Efficiency in Saccos

Agency banking ensures that people and businesses irrespective of their income levels and location are able to conveniently access affordable financial products and services. These factors influence the performance of organizations hence it is important to establish the factors that determine operational efficiency of Savings and Credit Cooperative (Sacco) Societies thus develop policies that will help the industry achieve the above objectives.

### 2.3.1. Corporate Governance and Leadership

According to Mwangi (2015), performance is where organizations formulate structures that enable them to achieve various objectives. However, creating strategies alone doesn't ensure the achievement of organizational objectives thus the need to have a leadership system that recognizes the need to decide on the appropriate reward systems, resources and culture to facilitate effective implementation. Therefore, the management of any given Sacco's is important in the realization of the organization's social, economic and environmental objectives. The implementation of strategies and achievement of

operational efficiency indicates a company's overall performance and is reliant on the system of governance.

### 2.3.2. Technical Innovation and Development

The capacity of organizations to develop and utilize innovative systems within their operations is a critical factor of performance. Companies that are able to conceptualize, create and implement advanced technologies are known to perform better and are usually associated with a greater competitive edge (Ouma, 2013). This element makes the adoption of technological innovations as a significant factor in the achievement of operational efficiency.

### 2.3.3. Government Regulations and Policies

The government is mandated with regulating all sectors of the economy including the financial industry that consists of banks and microfinances. According to Mwangi (2015), this regulation is conducted by the CBK and entails formulating fiscal and non-fiscal policies that set out the necessary checks and balances in the volatile financial sector. These policies and regulative measures affect the operations of most financial institutions including Sacco's in terms of nature of services and target consumer segments.

## 2.4. Empirical Studies

Berger (2007) conducted a global comparison of efficiency in the banking sector. The objective of the paper was to compare the differences in the consolidation and cross-border activities among banks and the influence on their efficiency. The study utilized 100 studies to make comparisons of bank efficiencies across nations and the related factors. The

findings were that operational efficiency of local and foreign owned banks is reliant on frontiers that result in efficiency advantages and disadvantages. Therefore, considering agency banking models as one of these effective frontiers for improving efficiency in the banking industry offers the study with a potential future area of study.

Wang, Sun and Zhang (2012) conducted a study on the operational efficiency of agricultural based cooperative societies in Langao, China. The study focused on the input factors and output factors that are associated with the operational efficiency of agricultural efficiency. The study sampled a total of 14 agricultural cooperatives and used the fuzzy Delphi method (FDM) to analyze the selected input and output determinants. The findings were that the functional efficiency of the agricultural cooperatives varied based on the application of distinct input factors and the resulting factors. From the above findings it is evident that input factors influence the operational efficiency of agricultural cooperatives. Therefore, operating efficiency of any given firm is reliant on the input factors such as assets and the management of costs which determine the output factors including operating income and number of members. These input factors can be associated with the adoption of mobile and agency banking systems that may influence the operational efficiency of agricultural cooperatives.

Oral and Yolalan (1990) conducted a study on the functional competence of branches belonging to profit-making banking facilities. The study's objective was to determine the operating efficiency of 20 major branches of the Turkish Commercial Bank. The study employed the DEA model in analyzing the data from the selected branches. The findings indicated that branches that were service-efficient were the most profitable hence

proposing the relationship between efficiency in service delivery and increased profits. Agent banks that are efficient in terms of service delivery offer a viable alternative to the branch model with an aim of enhancing functional efficiency of banking institutions.

Wahab, Ismail and Muhayiddin (2016) conducted a study on the factors that influence the operational excellence of SME's in Malaysia. The objective of the research was to evaluate the internal and external factors that affect the operational efficiency of SME's. The study encompassed a systematic literature review of the factors that lead to operational excellence in SME's across Malaysia. The findings were that internal factors including leadership style and the external factors including alignment with the surrounding operating capabilities influence the operational efficiency of various enterprises. Such operating capabilities would include the adoption of mobile banking services such as agency banking that have the potential of impacting the operational excellence of small and medium enterprises. Therefore, agent banks can be considered as one of the factors that influence the operational efficiency of SME's as both an internal and external element.

Rahman and Mazlan (2014) conducted a study on the factors that determine the operational efficiency of microfinance facilities in Bangladesh. The objective of the paper was to investigate operational sufficiency and its determinants of MFI's and then make comparisons with the situation in Bangladesh. The study utilized the secondary qualitative data including the financial statement of MFI's operating in Bangladesh and multiple regression analysis to measure the factors that influence operational efficiency. The findings revealed reducing operating costs and the proper utilization of resources to generate revenue influences the operating efficiency of micro finance institutions (MFI's).

Agency banking models focus the reducing operating costs to increase the levels of revenue while operational efficiency is associated the minimization of losses and the maximization of resource utilization. Therefore, one can evaluate the impact of agency banking as determining factor on the achievement of operational efficiency among microfinances.

In Kenya, a number of studies have been conducted on the influence of agency banks on the operational efficiency of financial institutions especially commercial banks. We shall use these relative empirical studies to assess the proposed hypothesis. Gitau (2014) conducted a study on the contribution of agent banks to the operational performance of major banks in Kenya. The research reviewed relevant literature and employed the descriptive research design to study the relationship between the variables. The data was analyzed using advanced statistical techniques. The findings showed that the availability of liquidity, cost of infrastructure and security influence the performance of commercial banks. These factors constitute the structural aspects of agency banking hence are important in the operational performance of commercial banks. Saccos are closely related to banks hence possess a number of similar functions including provision and enabling the access to financial products and services. Therefore, the variables of agent banks including liquidity and security tend to have a similar impact on the operational performances of Saccos.

Wanjiru& Willy (2016) studied the factors that influence the performance of Sacco Societies in Kiambu County. The study aimed at evaluating the factors affecting the financial performance of Sacco's in Kiambu County. The research sample included all the

12 registered cooperative societies in the county with the data retrieved from the audited annual reports of Sacco between 2010 and 2014. The data collected was analyzed using the linear regression analysis to show the relationship between corresponding change in ROA and ROE as a result of the changes in the number of members, dividend policy and loan defaulting rates. The study found out that factors such as membership size and dividend policy had an influence of performance related factors including ROA and Return on Equity. Financial performance is a significant element of operational efficiency and can be measured by the resulting change in the ROA and ROE factors. Therefore, membership size as influenced by functional capabilities such as access to financial services influences the change in ROA and ROE.

Agade (2014) conducted a study on the influence of macroeconomic elements on the operational efficacy of the banking industry. The study sought to find out how macroeconomic variables including GDP, lending rates, exchange rates and inflation affect the efficiency of commercial banks. The author utilized secondary data from publications, private financial reports, journals and business magazine. The data collected was analyzed using the DEA to determine the technical efficiency of selected banks. The findings were that macroeconomic factors affect the operational efficiency thus highlighting the possible influence of technological adoption in terms of agency banking on the banking sector's efficiency. Agency banking is a macroeconomic variable that influences the financial operations in the banking sector. As a result, evaluating its impact on the operational efficacy of banking facilities offers a broader look on the microeconomic elements that impact the delivery of financial products and services to various consumer segments.

Okwanga, Mungania&Karanja (2015) conducted a study on the factors that affect the operational efficiency of the Jua Kali industry with reference to the apparel industry in Nairobi, Kenya. The research sought to find the influence of management factors, the level of artisan skills and financial resources on the operational efficiency and employed the descriptive research design. The findings revealed that the availability of financial resources and management influence operational efficiency of the sector in terms of improving the working conditions and retention of employees. Therefore, the financial intermediary role of agency banking and its influence on the operational efficiency of credit unions can be related to the study under the aspect of financial resources.

Anyumba&Makori (2018) conducted a study on how agency banking affects the performance of SME's in Kenya. The study was based on sample of 3680 SME's in Kisumu County, Kenya and was guided by the various objectives including the influence of frontline customer services, intermediary banking transactions and account opening services on the performance of SME's. Furthermore, the study employed the correlation and regression analysis model in data analysis. The findings from the study revealed that the services offered by agent banks including frontline customer interactions and intermediary banking transactions influence the performance of SME's. Saccos usually target individuals and groups within the SME's industry who rely on the services offered by agent banks. Therefore, it is important to evaluate the possible influence of agency banking on the ability of Sacco Societies to provide financial services to players in the SME sector.

## 2.5. Conceptual Framework

The study demonstrated distinct sets of independent and dependent variables. This is shown using the relationship framework below:

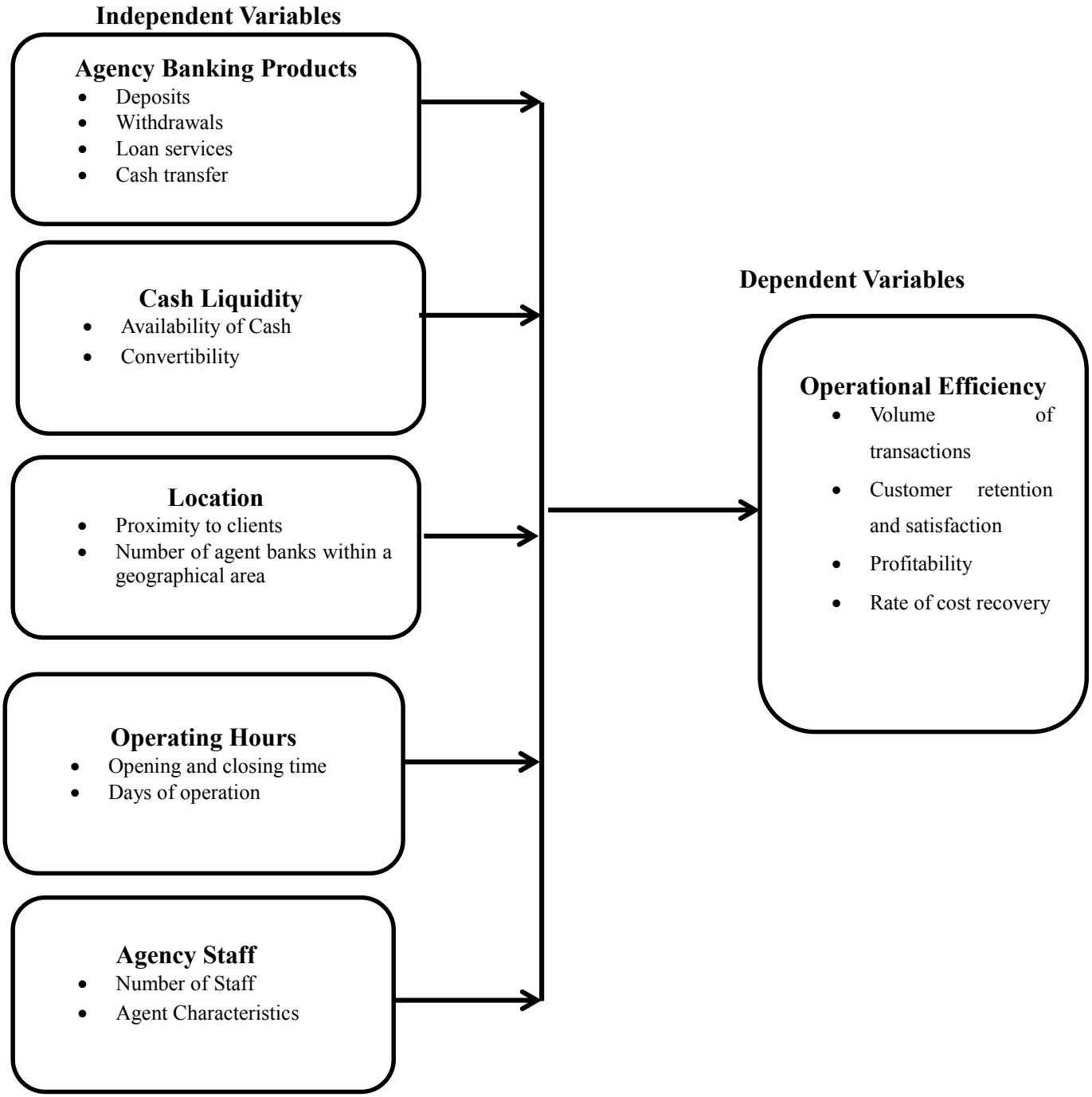



**Fig 1:** Conceptual Framework

# CHAPTER THREE: RESEARCH METHODOLOGY AND DESIGN

## 3.1. Introduction

The chapter provided a description of the research design to be used, the target population and a sample design, the methods that were used to collect data and the validity and reliability of the instruments and finally the data analysis section.

## 3.2. Research Design

This section strategized the framework for collecting and analyzing the data. The study adopted the descriptive data technique where data was collected without manipulating the research environment. This approach was useful in providing a description of and utilizing large populations to make the outcomes to be statistically significant (Ndolo, 2015). Furthermore, the descriptive design allowed the study to determine the correlation between independent variables either in isolation or combination and the impact on the dependent variable. This design allowed the paper to evaluate the influence of agency banking strategy on the operational efficiency of Sacco's.

## 3.3. Population

There are 15 licensed Sacco's in Kiambu County with several operational branches situated across the county. The target population comprised of 39 Sacco branches sampledacross 8 registered deposit taking Sacco Societies in Kiambu County that have adopted agency banking systems. Statistically, generalization can only take place when a sample of equal or more than 30 exists.

## 3.4. Sample Design

The study used census in selecting the participants for purposes of accuracy since the respondents were required to be purposively selected based on their experience and interaction with agency banking. The census method was the most appropriate methodology since the population was relatively small and heterogeneous as in the case of the selected Saccos for the study (Kiura&Runyora, 2016). The method enabled the research to gather information that will assist in data analysis and the determination of accurate results.

## 3.5. Data Collection

The study incorporated secondary data. The collection of secondary data involved the gathering of previously researched material. This data was obtained from supporting documents including audited and published financial reports of selected Sacco's and annual reports from SARSA that are related to the performance of cooperative societies. Furthermore, the study relied on Sacco's official websites, journals, newsletters and business magazines that highlight the performance of Sacco's and their respective branches in Kiambu County. The data collected from the secondary sources included actual number of agent banks operated by Saccos, the location of Sacco's agent banks in Kiambu County, the availability and convertibility of cash at agent banks, the number of staff and their characteristics within agent banks.

Also, the study collected data relating to the current documents indicating the profit and loss statements as well as balance sheets of Saccos, the customer reviews and feedback

from members of the sample population, transaction history and trends of Saccos. The data was collected over a period of three years from 2015 to 2017. This time period was based on the study's reliance on data highlighting the performance of the sampled Sacco and their respective branches since they adopted agency banking in 2015 and the operational efficiency indexes up to 2017 (Appendix II & III).

## 3.6. Validity and Reliability

According to Afandi (2015), research instruments ought to be reliable for them to yield consistent results or outcomes when applied more than once in the collection of data from varied samples drawn randomly from a given population. To determine the reliability of the data collection instruments, the research will conduct a pilot test to establish the consistency of the data collection instrument. The interview schedules will be distributed within the pilot group and the responses provided will be closely monitored to determine their validity and the whether the instruments were clear, precise and understandable.

## 3.7. Data Analysis

The data obtained from the secondary sources was analyzed using the Data Envelopment Analysis (DEA). This technique is usually utilized when measuring the efficiency of organizations that have the ability to produce optimum output from a given group of inputs or resources (Agade, 2014). The study used the intermediate approach of DEA which is more representative of the research objectives and effectively measures operational efficiency. The analysis compared the relative efficiency of agency banking outlets deployed by Saccos in providing financial services to members across Kiambu County with

the units of inputs utilized by the financial institutions. The specific inputs within the Sacco's bank agents include agency banking products such as withdrawal services, deposit, loan services and cash transfers, cash liquidity which is supported by the availability of cash and convertibility and location which is determined by proximity to clients and number of agency banking agents per Sacco in Kiambu County. The other input included the number and characteristics of agent staff employed by each organization. The outputs measured included units of profits gained, number of transaction volumes, and size of market share and the rate of recovering costs.

A simple regression analysis was utilized to show the relationship between agency banking and the operational efficiency of Sacco Societies. The model took the form of;

$\mathbf{Y= \beta +\beta_1X_1+\beta_2X_2+ \beta_3X_3+\beta_4X_4+\beta_5X_5+ \varepsilon,}$ Where

**Y**= Operational efficiency of Sacco's as measured by how efficiently Saccos utilize agency banking models to deliver financial services and products to achieve optimum profitability and customer transactions, rate of costs recovery and customer retention.

**β**= Constant,

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$= Co-efficient of determination,

**X=** Agency banking use measured by the products and services including deposits offered through agent banks and cash liquidity as determined by the availability and convertibility of agent cash. Agent staff is evaluated by the number of agency staff and their characteristics. Location is measured by the proximity of agent banks to clients and number of such banks per given geographical area while operating hours is determined by the days of active operation as well as the opening and closing time.

And **ε** = Residual error which was assumed to be zero for this study.

In order of the study to attain a 90% level of significance, the ANOVA (Analysis of Variance) was adopted. This method aimed testing the difference in the sets of data for purposes of homogeneity. The use of Test statistic F was utilized where the null hypothesis and alternative hypothesis highlighted the existence or absence of a correlation between the variables.

# CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

## 4.1. Introduction

This chapter presents information retrieved from the data that was collected on the impact of agency banking on the operational efficiency of Sacco Societies in Kiambu County, Kenya. The section provides adescription of rate of response; Data validation that was conducted through a pilot test and descriptive representations of the statistics. Additionally, a correlation sub-section provides an analysis of the relationship between the dependent and each of the independent variables as a well as the state of inter-correlations between the independent variables. The chapter also presents a model summary of the results, the analysis of variance (ANOVA) and the underlying model co-efficient. A discussion of the research findings is also provided to ascertain whether the findings support current theoretical frameworks.

## 4.2. Response Rate

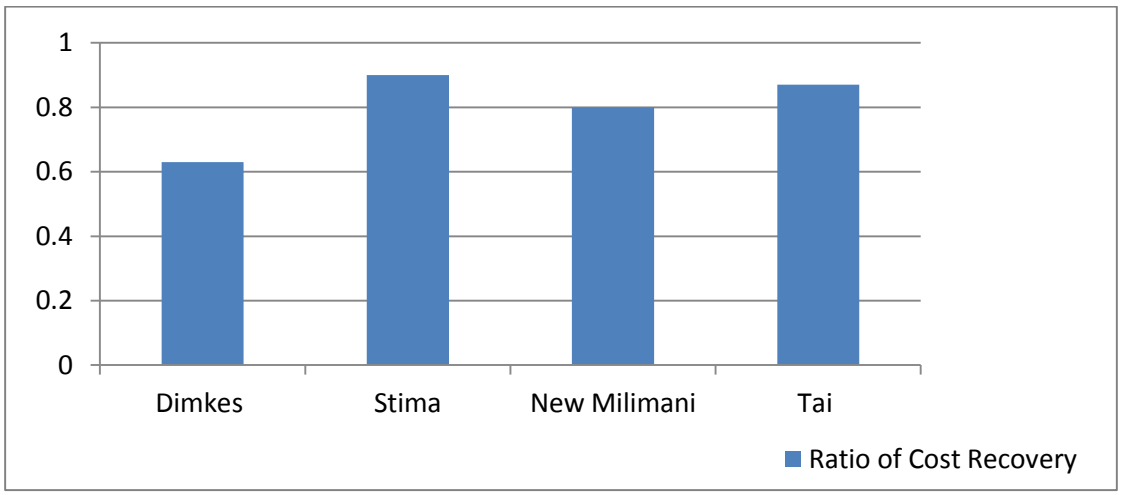
The study utilized secondary data collected from published materials. The documents included audited and published financial reports of the sample population and annual SARSA reports related to the performance of the Sacco Industry. Furthermore, data was collected from official publications on the Saccos' websites, business magazines and journals highlighting the relative performance of cooperative societies. A total of 31 branches across the eightSaccos provided consistent information based on the study period (2015-2017) and research variables. The study retrieved data on the independent and dependent variables within the Saccos and branches. The study attained a response rate of 79% based on the number of respondents sampled for the study. The remaining 21% of the

respondents (Saccos) availed reports outside the study period and limited the access to updated information. The information collected addressed both the dependent and independent variables including the correlations between them.

## 4.3. Data Validity

The study conducted a pilot test to determine the feasibility of the observation and analysis tool in the real world. In this study, the test sought to create consistent and authentic outcomes for each sample. The procedure involved creating operational definitions for each variable to enable the manipulation of the variables and applying them to the data collected from the secondary sources (Hoffman et al., 2008). To validate the data, the study ran a static condition by correlating the independent variable (agency banking) and the dependent variable (operational efficiency). Each component of the independent variable was associated with the dependent variable to determine the appropriate levels that would ensure the reliability of the results. The pilot test discovered that a larger number of samples were necessary to enhance the validity of the outcomes. Therefore, if the research was conducted using a large population, then it was likely that the results would have been greatly significant and highly reflective of the sample population. After collecting data from the branches of four Saccos, an analysis of variance (ANOVA) comparing the rate of cost recovery of Saccos was performed to determine the relative efficiency within each respective Sacco. Figure 2, indicated the ratio of cost recovery within Saccos in Kiambu County.

**Fig 2:** Relative Efficiency of Sacco Branches in terms of the Rate of Cost Recovery




The pilot test helped in determining the most effective way to manipulate the independent variables.

## 4.4. Descriptive Statistics

This section provides descriptive analyses of the independent and dependent variables.

**Table 4.1**: Descriptive Statistics of the Study Variables

| | Agent ban king | Location | Operating hours | Agent Staff | Ratio of Cost recovery | Profits (000,000) | Customers Retained(000) | Liquidity Ratio |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| Mean | 12.33 | 12.33 | 8.67 | 1.33 | 0.72 | 192.96 | 12.12 | 0.97 |
| Standard Error | 0.95 | 0.95 | 0.33 | 0.21 | 0.07 | 105.92 | 5.6 | 0.02 |
| Median | 12 | 12 | 8.5 | 1 | 0.73 | 48.63 | 8.12 | 1 |
| Mode | 12 | 12 | 8 | 1 | #N/A | #N/A | #N/A | 1.08 |
| Standard Deviation | 2.34 | 2.33 | 0.82 | 0.52 | 0.17 | 259.44 | 13.7 | 0.12 |
| Sample Variance | 5.47 | 5.47 | 0.67 | 0.27 | 0.03 | 6.73 | 187793 | 0.01 |
| Kurtosis | -0.91 | -0.91 | -0.3 | -1.87 | -0.48 | 0.72 | 2.23 | 0.001 |
| Skewness | -0.04 | -0.04 | 0.86 | 0.97 | -0.65 | 1.39 | 1.49 | 0.002 |

The results in Table 4.1 showed that the products of agent banks for Saccos had a mean of 12.33; the location of agent banks had a mean of 12.33 and the operating hours for Sacco agents having a mean of 8.66. The number of trained staff per agent bank had a mean of 1.33 and liquidity ratio had a mean of 0.97. The analysis of skewness showed that agency banking products, liquidity ratio and the location of agent banks were asymmetrical to the left while the operating hours and the number and characteristics of agent staff were asymmetrical to the right.

The results in Table 4.1 also showed that customer retention from 2015 to 2017 had a mean of 12,124.83; profits had a mean of 192, 966, 679 and the ratio of cost recovery had a mean of 0.72. Analysis of skewness showed that customer retention, profits and the ratio of cost recovery were all asymmetrical to the right.

Diagnostic Tests

Data assessment was conducted to find out if the data set has a normal distribution. Normality in statistics is a concept that is essential when conducting the correlation and the multiple regression analysis. The values of kurtosis and skewness measures for the independent variables were done to assess the normality. A perfectly normal distribution is usually indicated by a value of zero. Based on the assessment, there was no departure from an assumption of normality that was extreme as indicated in table 4.10. Therefore, this gives a confirmation that the data is suitable for analysis by use of parametric tests.

Agency banking products skewness of statistics was -0.04, location was -0.04, operating hours was 0.86, agent staff was 0.97 and liquidity was 0.002. The kurtosis statistic for both agency banking products and location was -0.91, operating hours was -0.3, agent staff was -1.88 and liquidity was 0.002.

**Table 4.2**: Tests for normality

| **Scale** | **Skewness** | **Kurtosis** |
|---|---|---|
| | Statistic | Statistic |
| Agency banking (products and services) | -0.04 | -0.91 |
| Location | -0.04 | -0.91 |
| Operating hours | 0.86 | -0.3 |
| Agent Staff | 0.97 | -1.88 |
| Liquidity ratio | 0.002 | 0.001 |

## 4.5. Correlation Analysis

The study conducted a correlation analysis so as to analyze the extent of the impact of agency banking models including the products offered, the location of agent banks, the liquidity of Sacco agents and the operational hours on the operational efficiency of Saccos in Kiambu County. Data on the products within agency banking, their location and the number of trained staff per agent bank, the duration of operation and liquidity ratio were computed into single variables per each dependent variable to determine the correlation.

The study adopted three correlation models to address each predictive variable as informed by the Data Envelopment Analysis that evaluated the relative efficiency of the dependent variables across the sampled Saccos. Pearson's correlation analysis was then conducted at 90% confidence interval and 10% confidence level 2tailed. The correlation matrixes for the ratio of cost recovery and customer retention were suitable and reliable in indicating the correlation between the dependent variables and the independent variables including agency banking products, location, operation hours, cash liquidity (ratio) and the agent staff.

Table 4.3 indicates the correlation between the ratio of cost recovery within Saccos and the independent variables. The analysis revealed a positive relationship between the liquidity of agent Saccos, the operating hours of agent banks and the number of trained staff per agent bank and the ratio of cost recovery within Saccos in Kiambu County. This positive relationship indicated a correlation between the ratio of cost recovery and the duration of operation, agent staff and liquidity of agent banks. This inferred that liquidity, operating hours and agent staff have the greatest effect on the rate of cost recovery. The table also indicated a negative relationship between locations, agent banking products and the ratio of cost recovery within Saccos in Kiambu County.

**Table 4.3**: Correlation Matrix for Ratio of Cost Recovery

| | **Ratio of Cost recovery** | **Agent Banking (Products and Services)** | **Location** | **Operating hours** | **Agent Staff** |
|---|---|---|---|---|---|
| Liquidity | 1 | | | | |
| Agent Banking | -0.23 | 1 | | | |
| Location | -0.22 | 1 | 1 | | |
| Operating hours | 0.03 | 0.17 | 0.17 | 1 | |
| Agent Staff | 0.14 | -0.77 | -0.77 | -0.16 | 1 |

Table 4.4 below indicates the correlation between customer retention and the independent variables that included the location, liquidity, operating hours, agent staff and the products within the agent banks of Saccos in Kiambu County.

**Table 4.4:** Correlation Matrix for Customer Retention

| | Customer retention | Agent banking (Products and Services) | Location | Operating hours | Agent Staff |
|---|---|---|---|---|---|
| Liquidity Ratio | 1 | | | | |
| Agency banking | 0.47 | 1 | | | |
| Location | 0.47 | 1 | 1 | | |
| Operating Hours | 0.73 | 0.17 | 0.17 | 1 | |
| Agent Staff | -0.48 | -0.77 | -0.77 | -0.16 | 1 |

According to the table above, there was a positive relationship between customer retention and agency banking products and services, location, liquidity ratio and operating hours. This positive relationship inferred that the location of agent banks, agency banking products and operating hours in terms of the number of days and hours affected the ability of Saccos in Kiambu County to acquire and retain customers. There was a negative relationship between the number and characteristics of agent staff and the retention of customers within the sampled Saccos.

## 4.6. Regression Analysis and Hypothesis Testing

The study conducted a multiple regression on several determinants of operational efficiency of Saccos in Kiambu County over the period between 2015 and 2017. Coefficient of determination explained the extent to which changes in the units of agency banking influenced the operational efficiency of 39 branches across eight licensed deposit taking SACCOS in Kiambu County. This was explained by the change in the dependent variables including the profits earned, the number of customers retained and the rate of cost recovery based on the percentage of variation in the independent variables such agency

banking products, liquidity ratio, location, and number and agent characteristics. As indicated earlier, the study adopted the Data Envelopment Analysis technique to evaluate the impact of the decision making units under agency banking on the operational efficiency of Saccos in Kiambu County. The study adopted three models based on the suitable measures of operational efficiency that included profits gained, customer retained and the rate of cost recovery within Saccos. Below are regression analysis tables indicating the contribution of the independent variables to each dependent variable.

Table 4.5 indicates that the five independent variables studied only explained 18.6% of the rate of cost recovery of Saccos in Kiambu County as represented by the $R^2$. This meant that the study variables contribute 18.6% to the efficiency of the sample population while other factors not studied in the research contribute 81.4% to the efficiency in recovering costs within Saccos in Kiambu County. Therefore, further research ought to be conducted to investigate the other (81.4%) factors that influence the rate of cost recovery of Saccos in Kiambu County.

**Table 4.5:** Regression Analysis (Ratio of Cost Recovery)

| **Regression Statistics** | |
|---|---|
| Multiple R | 0.24 |
| R Square | 0.06 |
| Adjusted R Square | 1.86 |
| Standard Error | 0.26 |
| Observations | 39 |

The table 4.6 below indicates that the five independent variables studied contributed 21% to the profits earned within Saccos in Kiambu County from 2015-2017.

**Table 4.6**: Regression Analysis (Profits)

| **Regression Statistics** | |
|---|---|
| Multiple R | 0.94 |
| R Square | 0.88 |
| Adjusted R Square | 0.21 |
| Standard Error | 0.14 |
| Observations | 39 |

This meant that the independent variables including agency banking products, location, liquidity, operating hours and agent banking staff contribute to only 21% of the operational efficiency of Saccos in Kiambu County while other factors not studied in this research contribute 79% to the profits gained by Saccos within the study period. Therefore, a study should be conducted on the other factors that contribute 79% to the operational efficiency of Saccos in terms of profit or surplus retained over 2015-2017.

**Table 4.7:** Regression Analysis (Customer Retention)

| **Regression Statistics** | |
|---|---|
| Multiple R | 0.83 |
| R Square | 0.69 |
| Adjusted R Square | -0.28 |
| Standard Error | 12115.63 |
| Observations | 39 |

Table 4.7 indicates that the five independent variables contributed only 28% to the customer retention of Saccos in Kiambu County between 2015 and 2017 as represented by the adjusted $R^2$. This meant that location, agency banking products, agent staff, liquidity and operating hours contributed 28% to the operational efficiency of Saccos as measured by the number of customers retained over the study period. Therefore, other factors which are not studied by this research contributed 72% to the number of customers retained by Saccos in Kiambu County hence a study should be conducted to investigate these factors.

**Table 4.8:** Summary of ANOVA

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 4 | 0.008 | 0.002 | 0.04 | 0.99 |
| Residual | 2 | 0.14 | 0.07 | | |
| Total | 6 | 0.15 | | | |

From the table above, the processed data, which are the population parameters had a significance level of 0.99 which shows that the data is ideal from making conclusive remarks based on the population parameters. The F calculated at 10% level of significance was 0.04. Since F calculated was greater than the F critical, this shows that overall model was significant i.e. there is a significant relationship between operational efficiency and its determinants.

**Table 4.9**: Regression of Coefficients

| | **Coefficients** | **Standard Error** | **t Stat** |
|---|---|---|---|
| Intercept | 0.90 | 1.84 | 0.49 |
| Liquidity | 0.001 | 0.12 | 0.008 |
| Agent Banking (Products and Services) | -0.02 | 0.08 | -0.27 |
| Location | -0.02 | 0.08 | -0.27 |
| Operating hours | 0.01 | 0.15 | 0.04 |
| Agent Staff | -0.02 | 0.36 | -0.07 |

The coefficient of regression in table 4.9 was used in developing the model below:

**OE**= 0.90 -0.02 L - 0.02 AB + 0.001 LQ+ 0.01 OH - 0.02 AS

Where, OE was financial performance, AB is agency banking products (deposits, withdrawals, funds transfer), L represents the location of agent banks, OH is operating hours. LQ represents liquidity and AS is agent staff (number and characteristics). According to the model, all the variables were significant as their significance value was less than 0.05. Also, the location, agency banking products and agent staff were negatively correlated while operating hours and liquidity were positively correlated to the operational efficiency of Saccos in Kiambu County. Based on the model, taking all factors including agency banking products provided, location and number of trained staff and operating hours constant at zero, the operational efficiency of Saccos in Kiambu County was 0.90. Furthermore, the data analyzed also showed that when all other independent variables remain at zero, an increase in the operating hours by one unit lead to a 0.01 increase in the

operational efficiency of Saccos in Kiambu County; a unit increase in liquidity led to 0.001 increase in the operational efficiency of Saccos in Kiambu County; a unit increase in location and agency banking products and servicesled to a 0.02 decrease in the operational efficiency of Saccos in Kiambu County. This meant that operating hours contributed most to the operational efficiency of Saccos in Kiambu County followed by liquidity while agent staff, agency banking products and location had a negative significant impact on the operational efficiency Saccos in Kiambu County.

## 4.7. Interpretation of Findings and Discussions

Based on the regression model, the study established that there were factors that influence the operational efficiency of licensed deposit taking Saccos in Kiambu County which include the agency banking products (deposits, withdrawals), agency staff and liquidity. These factors influenced the operational efficiency of the sampled Saccos either positively and negatively. The study found out that intercept was 0.90 for the study period between 2015 and 2017. The study proposed to study five independent variables based on the sufficiency of data. These variables included the agency banking products and services provided by Saccos, the number and characteristics of agency staff, the location of agent banks, operating hours and liquidity. Under the rate of cost recovery, the five independent variablescontribute 18.6% of operational efficiency in Saccos within Kiambu County as represented by the adjusted $R^2$ (Table 4.5). The independent variables also contributed 21% of the profits earned and 28% of the number of customers retained within Saccos in KiambuCounty from 2015 to 2017 (Table 4.6; 4.7).

Based on the theory of agency banking, financial institutions contract third parties especially retail outlets such as shops to provide financial services to a majority of the unbanked population. This strategy has enabled financial institutions to avail low value mass market financial commodities to low income and disadvantaged consumers whose value and volume and transactions are considered as low. Therefore, the findings of the study where the various factors of agency banking have an influence on the operational efficiency of Saccos supports the theory of agency banking that is founded on the theory of distribution channels and the theory of finance. This is evidenced by the emphasis on the enhanced access to financial services through the delivery of financial products using agency banking systems that rely on convenient location, optimal liquidity ratio, flexibility in operating hours and days, a variety of products and services and the number and characteristics of agent staff.

Furthermore, the study found out that there is a positive and negative relationship between the various factors of agency banking. Based on the findings, the liquidity of Saccos, the operating hours of agent outlets and the number of trained staff per agent bank had a positive relationship on the ratio of cost recovery of Saccos in Kiambu County. However, there was a negative relationship between agent bank location, the products and services offered and the rate of cost recovery among Sacco. This correlates with Wahab, Ismail and Muhayiddin (2016) who conducted a study on the factors that influence the operational excellence of SME's in Malaysia. The study found out that internal factors and the external factors including alignment with the surrounding operating capabilities influence the operational efficiency of various enterprises. Such operating capabilities include the

adoption of innovative banking services such as agency banking that have the potential of impacting the operational excellence of small and medium enterprises. Also, the study correspondent with the study of Wang, Sun and Zhang (2012) on the operational efficiency of agricultural based cooperative societies in Langao, China. The findings were that operating efficiency of any given firm is reliant on the input factors which determine the output factors including operating income and number of members. These input factors such as the adoption of mobile and agency banking systems indicated an influence on the operational efficiency of credit unions.

According to the study, the independent variables within agency banking have a significant influence on the operational efficiency of Saccos in Kiambu County. However, the findings indicate that factors such as operating hours, location and liquidity contributed the most to the operational efficiency of the study sample within the study period 2015-2017 while agent staff and location had the least impact on operating efficiency of Saccos. This is in line with Agade (2014), who conducted a study on the influence of macroeconomic elements on the operational efficacy of the banking industry. The research found out that macroeconomic variables including GDP, lending rates, exchange rate, inflation and adoption of technology affect the efficiency of commercial banks. Therefore, the utilization of agency banking as an innovative tool influences the operational efficiency of financial institutions including Saccos within the banking industry. Additionally, the findings are consistent with Berger (2007) who conducted a global comparison of efficiency in the banking sector. The study found out that operational efficiency of local and foreign owned banks is reliant on frontiers that result in efficiency advantages and disadvantages. These frontiers include the agency banking frontier which has the potential of improving

efficiency in the banking industry including the functional efficacy of Saccos in Kiambu County.

The study also found out that the co-efficient of liquidity of agent banks was 0.001, meaning that liquidity ratio positively and significantly influenced the operational efficiency of Saccos in Kiambu County. This coincides with the study by Rahman and Mazlan (2014) on the factors that determine the operational efficiency of microfinance facilities in Bangladesh. The findings revealed that reducing the operating costs and the proper utilization of resources to generate revenue influences the operating efficiency of micro finance institutions (MFI's). Liquidity ratio is a component utilizing financial resources to levels of revenue while operational efficiency is associated the minimization of losses and the maximization of resource utilization. Also, the study related with the study by Gitau (2014) on the contribution of agent banks to the operational performance of major banks in Kenya. The findings showed that the liquidity, cost of infrastructure and security influence the performance of commercial banks. Therefore, the variables of agent banks including liquidity and security tend to have a similar impact on the operational efficiency of Saccos.

Furthermore, the findings support the branchless banking theory that focuses on how branchless banking with respect to agent banks is conducted. Under the branchless banking model, licensed agents are usually allowed to distribute financial products and services to consumers through a retail agent or store. Therefore, the study outcomes indicating the influence of agency banking factors such as liquidity on the operational efficiency of Saccos in Kiambu County are aligned with the ideology of branchless banking where agent

banks within Saccos have access to the required level of cash liquidity to offer financial services including deposits and withdrawals to customers.

The study found out that the coefficient the number of agent staff and their characteristics was -0.20, meaning that the location of agency banking outlets and the characteristics of agent staff negatively but significantly influenced the operational efficiency of Savings and Cooperative Societies (Saccos) in Kiambu County. This correlates with previous research conducted by Anyumba&Makori (2018) on how agency banking affects the performance of SME's in Kenya. The findings from the study revealed that the services offered by agent banks including frontline customer interactions and intermediary banking transactions influence the performance of SME's. Also, the study was related to Oral and Yolalan's (1990) study on the functional competence of branches belonging to profit-making banking facilities. The findings indicated that branches that were service-efficient were the most profitable hence proposing the relationship between efficiency in service delivery and increased profits. Agent banks that are efficient in terms of service delivery offer a viable alternative to the branch model with an aim of enhancing functional efficiency of banking institutions.

Based on the findings, it is evident that the operational efficiency of Saccosin Kiambu County were influenced by the decision making units under the agency banking model which include the location and the products offered within the agent banks. These outcomes support the theory of operational efficiency that focuses on the designing and management of business operations with an aim of maximizing profits. This is usually achieved through the operation of efficient production and delivery of products and services to consumers at

the right value (Allen, 2011). In the case of the Saccos sampled by the study, their operational efficiency was hinged on their ability to operate at the highest level in terms of the performance of agency banking models by managing business operations through agent banks with an aim of achieving efficiency in terms of profits.

Finally, the study established the relationship between the independent and dependent variables. These variables included the agency banking factors such as location of agency banking outlets, the number and characteristics of agents, the operating hours, and the agency banking products and services and liquidity of agent banks. The dependent variables included the profits gained, the number of customer and the rate of cost recovery within Saccos in Kiambu County. These findings support the contingency theory that is based on the understanding that one element is dependent on other elements.

Therefore, operational efficiency is seen to be dependent on the adoption of agency banking where the Saccos engaged in the contingency action of adopting agency banking with an aim of influencing their respective operational efficiency or performance. It is important to note that the theoretical perspectives under the contingency theory emphasize on how contextual factors of agency banking such as agent bank location, number and characteristics of agent staff affect the functional efficiency of financial institutions particularly Saccos.

# CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.1. Introduction

This chapter presents a description and summary of the research findings from the study of how agency banking impacts the operational efficiency of Saccos in Kiambu County. It further provides conclusions based on the research findings in Chapter Four and recommendations on what Saccos need to put in place to improve the their operational efficiency.

## 5.2. Summary

Savings and Credit Cooperative (Sacco) Societies enable members to make collective efforts in order to achieve common goals on both voluntary and democratic terms. These organizations encourage members to manage their finances properly and invest wisely in income generating activities. In Kenya, Sacco's are licensed to undertake deposit-taking services in the County of Kiambu. There are almost 15 licensed deposit-taking cooperative societies operating in Kiambu County. According to recent research, Saccos have grown in size, structure and variety by offering a range of products and services through the adoption of technology and financial models that aim improving the speed of transactions, offering clients enhanced flexibility and reducing the overall costs of conducting business.

The recent reforms in the Sacco industry revolutionized the type and quality of products and services delivered to customers by cooperative societies. Currently, Sacco's have focused on improving their performance in fiscal terms by adopting various practices including agency banking that integrate access to affordable and reliable financial services.

Agency banking involves the provision of financial products and services to individual and corporate clients by use of independent retail outlets or agents. These outlets depend on mobile based technological innovations such as the point of sale (POS) device and mobile phones to provide real time transactions of funds. However, the adoption of agency banking models by credit unions in Kiambu and the country at large has been an area of concern with only a handful of them having adopted the practice within their business operations. Based on the study, Saccos across Kenya particularly those in Kiambu County have adopted agency banking models within their operations. The platform focuses on availing point of sale (PoS) systems to Sacco agents who are tasked with offering financial services to members. These services included deposits, withdrawals and cash transfers.

The study adopted the descriptive data technique where data was collected without manipulating the research environment. The descriptive statistics represent the independent and dependent variables separately. This approach was useful in providing a description of the study variables to make the outcomes to be statistically significant. The sampled population comprised of the 39 branches operated by eight registered deposit taking Saccos in Kiambu County that have adopted agency banking systems andhad participated in providing information used to determine the correlations between the variables. Also, the study utilized census in selecting the participants for purposes of accuracy since the respondents were required to be purposively selected based on their experience and interaction with agency banking. The study incorporated secondary data that was obtained from audited and published financial reports of selected Sacco's and annual reports from SARSA that are related to the performance of cooperative societies. Furthermore, the study

relied on Sacco's official websites, journals, newsletters and business magazines that highlight the performance of Sacco's in Kiambu County.

Based on the findings, the study established that agency banking had a significant influence on the operational efficiency of Saccos in Kiambu County. This was achieved through the utilization of audited and published financial reports of the sample population and annual SARSA reports related to the performance of the Sacco Industry. The study attained a response rate of 75% out of the total respondents sampled for the study with a significant number of the respondents (Saccos) availing reports outside the study period and 25% limiting the access to sufficient updated information. This compelled the study to rely on current averaged performance reports especially on the liquidity of Saccosfrom 2015-2017 provided by the regulatory authority (SARSA) since the adoption of agency banking in 2015.

The findings revealed that the products and services offered by agent banks within Saccos had a mean of 12.33, location of agent banks had a mean of 12.33, and operating hours had a mean of 8.66, agent staff number per PoS had a mean of 1.33 and liquidity had a mean of 1.08. On the other hand, customer retention had a mean of 12,124.83, profits gained had a mean of 192966679.7 and the ratio of cost recovery had a mean of 0.72. The analysis of skewness for the independent variables indicated that agency banking products and the location of agent banks were asymmetrical to the left while the operating hours and the number and characteristics of agent staff were asymmetrical to the right. The study simplified the analysis into three models based on the output units to enable a comprehensive assessment of the correlation between the independent and dependent

variables. Data on the products of agent banks, their location and the number of trained staff as well as liquidity ratio were computed into single variables per variables by obtaining the averages for each variable.

One of the fundamental elements of agency banking is the provision of diverse financial products and services to enhance fiscal inclusion especially of Sacco members. According to Bizah, Gumbo &Magweva (2017), agency banking relies on the relationship between a bank (principal) and a business person (agent) where the latter performs banking services on behalf of the principal who delegated the decision making authority. Therefore, it was important for Saccos to develop agency banking systems within their structures to enhance the provision of financial products and services. Based on the findings, there was a positive relationship between the liquidity of agent Saccos, the operating hours of agent banks and the number of trained staff per agent bank and the ratio of cost recovery within Saccos in Kiambu County.

This inferred that liquidity, operating hours and agent staff have the greatest effect on the rate of cost recovery. Also, there was a positive relationship between customer retention and agency banking products and services, location, liquidity ratio and operating hours. This positive relationship inferred that the location of agent banks, agency banking products and operating hours in terms of the number of days and hours affected the ability of Saccos in Kiambu County to acquire and retain customers. This showed that agency banking products; their respective location and the number of trained staff per each agent bank have a significant effect on the profits or surplus retained and the ratio of cost recovery.

The study determined a positive relationship between the liquidity of Saccos and the operational efficiency of Saccos in Kiambu County.

## 5.3. Conclusion

The study sought to establish the impact of agency banking of the operational efficiency of Saccos across their respective branches in Kiambu County. Based on the findings, the liquidity of agent Saccos, the operating hours of agent banks and the number of trained staff per agent bank have a positive relationship with the ratio of cost recovery within Saccos in Kiambu Countyas the firms are able to provide financial services to more members through increased hours of operation and the number of trained staff. Also, the study established that liquidity of agent banks within the Sacco structure influences the operational efficiency of Saccos in Kiambu County. Therefore, the study concluded that the factors of agency banking including the products and services of agent banks, their distribution in terms of location, the number and characteristics of agents employed and the liquidity ratio have a significant influence on the on the operational efficiency of Saccos in Kiambu County. Furthermore, the study established that the influence was representative of a majority of Saccos that have adopted agency banking in Kiambu County with the input factors including the location of agent banks, the products and services offered as well as the liquidity having a canvas effect on the relative efficiency of the sampled Saccos.

## 5.4. Recommendations

The study established that agency banking provides an efficient platform to offering financial services; however, there is lack of emphasis on the level of customer relations

that are associated with the service. The study recommended that the provision of frontline services to customers should be improved with the products and serviced being relayed meeting the required standards and quality. Also, there is a need for Saccos to increase the number of agent banks so as to reach more customers while ensuring the continued improvement of the existing products and services to ensure that members are satisfied with new customers coming on board.

The study also established the influence of liquidity on the operational efficiency of Saccos with respect to the profits or surplus retained per year and the rate of cost recovery. Therefore, the study recommended that Saccos enhance their liquidity ratio so as to enable the ease of cash flow within their agent banks to enhance the provision of financial products and services. It is important for Saccos to increase their liquidity ratio to be higher than the average rate for Saccos in the industry as stipulated by SARSA. This will enhance the availability and convertibility of cash needed to facilitate financial services including deposits, fund transfers and withdrawals within the agent banks.

Additionally, the study established that the number and characteristics of agent staff as well as location are essential factors within the agency banking model. With an optimum number of trained staff assigned to agent banks located in different areas, Saccos have the potential to enhance their operational efficiency with respect to retaining and gaining more customers and achieving the highest rate of cost recovery. Therefore, the study recommended that Saccos employ a sufficient of trained agent staff to provide the necessary products and services to a wide range of customers. Also, the agent outlets should

be located in more regions to enhance the access to financial services by members especially in rural and semi-urban areas.

## 5.5. Limitations of the Study

The study encountered a number of challenges that limited the collection of relevant data. First, the study faced the challenge of obtaining updated data from the regulating body of cooperative societies in Kenya (SARSA) and Sacco management teams with both exhibiting limited cooperation in providing in depth information on the agency banking models and some operating factors including membership numbers and profits recorded from 2015-2017. However, the researcher provided detailed explanations of how the data will be used for academic purposes to prompt authorized access to the necessary data. Furthermore, the data retrieved from official websites, publications and newsletters was limited in terms of providing the required information hence the study resorted to standardize the data for the sample to generate representative outcomes.

To attain the objectives of the study, the researcher was limited to 8 licensed deposit-taking Saccos in Kiambu County that adopted agency banking in 2015 and studied their performances up to 2017. The study was also limited in terms of the degree of the precision of the data collected from the financial reports and AGM meetings of Saccos in Kiambu County. Time was also a limiting factor in the collection of data especially when the Sacco management teams and SARSA delayed in providing annual financial and progress reports. To mitigate this problem, the study relied on making consistent follow up on the data from Saccos and enhanced collection by regular checking for updated information from the Saccos.

Furthermore, the study was limited by financial resources with the researcher being compelled to draft a budget that would enable the study to be completed within the required time and at the desired cost. Since the research aimed at relying on published and audited financial reports, the researcher was compelled to make regular visits to the sampled Saccos to enhance data collection and limit the delay encountered during the data collection phase.

## 5.6. Suggestions for Further Research

Since the study focused on the impact of agency banking on the operational efficiency of deposit taking Saccos in Kiambu County, further studies should be conducted on all Saving and Credit Cooperative Societies in Kenya to allow for a more representative findings on the operational efficiency of Saccos in the entire country. This would require a comprehensive study on the Saccos that have been licensed by the Sacco Society Regulatory Authority (SARSA) to ensure that the research is focused on registered Saccos and allow for the determination of findings based on genuine organizations.

Further research should also be conducted on the various challenges that influence the adoption of agency banking among the licensed Saccos in Kiambu County. The study has outlined the impact of agency banking on the operational efficiency as evidenced by individual factors including the products and services offered by agent banks, the location and liquidity of agent banks and their influence on the profitability, customer retention and rate of cost recovery in Saccos. These factors determine the efficacy of adopting agency banking and provide a number of challenges that may limit the adoption of the financial

inclusion model. Therefore, it is important for further research on the potential challenges that may influence the adoption and performance of agency banking in Saccos.

The study also recommends that further studies be conducted on the impact of specific factors that influence the operational efficiency of Saccos. It is imperative for future studies to focus on a specific input of agency banking and a given output within Saccos to ensure that the study presents more centralized outcome that can be used to generalize the operational efficiency of Saccos in Kiambu County. The study proposes a similar study to be done whereby the data will be collected from primary sources including questionnaires and interviews so as to compliment this research.

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# APPENDICES

## Appendix I: List of Licensed Saccos in Kiambu County with Agent Banks

1. Dimkes Sacco
2. Stima Sacco
3. Githunguri Dairy and Community (GDC) Sacco
4. New Milimani Sacco
5. Tai Sacco
6. K-unity Sacco
7. Metropolitan Sacco
8. Urithi Housing Cooperative Society

**Appendix II: Important statistics for deposit taking savings and credit cooperatives (DTSs)**

| Key trends in performance of Deposit Taking Savings and Credit cooperatives (DTSs) | | | | |
|---|---|---|---|---|
| Indicator | 2013 Kes.Billions | 2014 Kes.Billions | 2015* Kes.Billions | Growth in 2015 (%) |
| Assets | 257,368 | 301,537 | 338,246 | 12,2 |
| Deposits | 182,683 | 205,974 | 236,058 | 14.6 |
| Loan and Advances | 197,409 | 228,524 | 248,934 | 8.9 |
| Capital Reserves | 32,991 | 43,086 | 61,908 | 43.6 |

(Source; ICPAK)

## Appendix III: Growth and Performance Trends of DT-SACCOs in 2017

*Table 9: Growth and Performance Trends of DT-SACCOs in 2017*

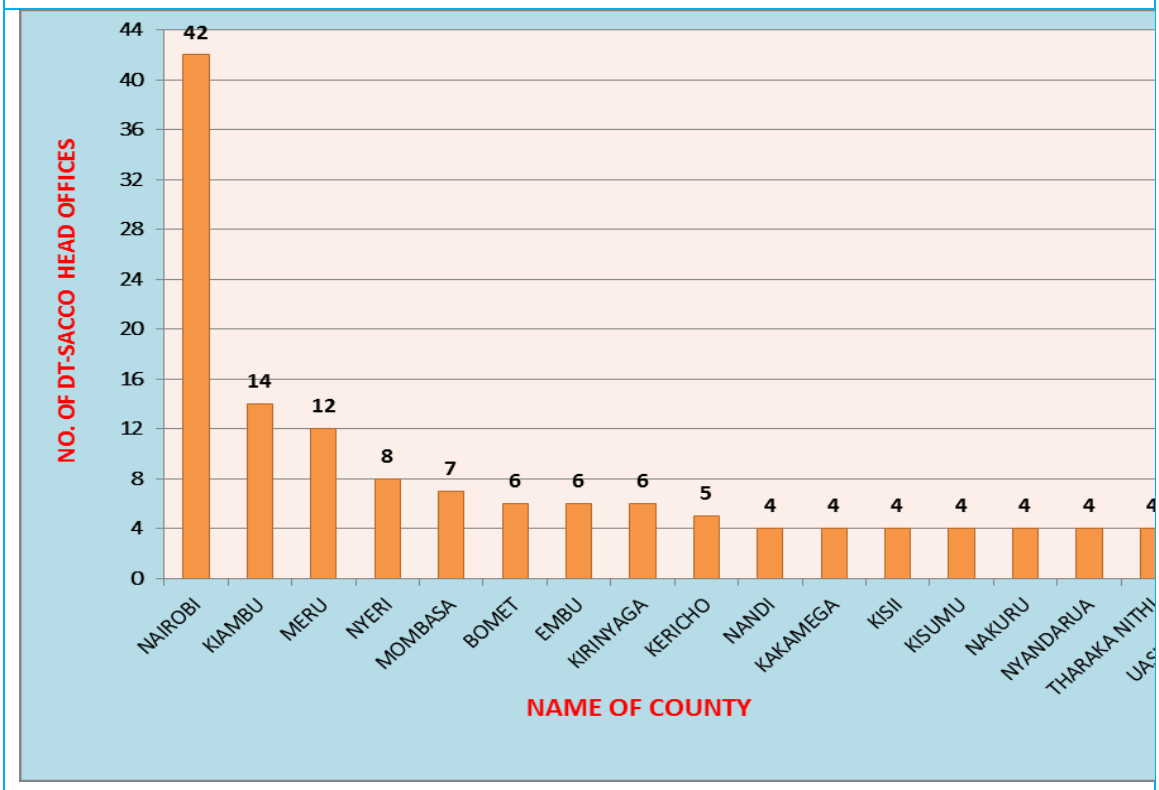
| PARAMETER | 2017 | 2016 | Y-to-Y Change % | 2015 | Y-to-Y Change % |
|---|---|---|---|---|---|
| Number of DT-SACCOS | 174* | 176 | - | 177 | -0.6 % |
| Active Membership | 3,116,674 | 3,143,485 | -1.35 % | 2,675,050 | 17.5 % |
| Dormant Membership | 482,526 | 489,112 | -0.85 % | 466,911 | 4.8% |
| Total Membership | 3,599,200 | 3,632,597 | -0.92 % | 3,141,961 | **15.6 %** |
| **FINANCIALS** | **KSHS. MILLIONS** | **KSHS. MILLIONS** | | **KSHS. MILLIONS** | |
| Total Assets | 442,277 | 393,499 | 12.40 % | 342,848 | 14.8 % |

| | | | | | |
|---|---|---|---|---|---|
| Total Deposits | 305,305 | 272,579 | 12.01 % | 237,440 | 14.8 % |
| Gross Loans | 331,212 | 297,604 | 11.29 % | 258,183 | 15.3 % |
| Allowance for loans Loss | 10,718 | 8,683 | 23.44 % | 7,103 | 22.2 % |
| Net Loans &Advance | 320,494 | 288,921 | 10.93 % | 251,080 | 15.1 % |
| Capital Reserve | 72,328 | 61,261 | 18.07 % | 50,835 | 20.5 % |
| Core Capital | 64,254 | 54,943 | 16.95 % | 41,712 | 31.7 % |
| ***TheFinancialsfor2017relatedto174DT-SACCOsonly,becausetwo(2)DT-SACCOsfailedtomeettheirobligationsandhad<br>their respective licenses revoked as at the time of publishing this report* | | | | | |

## Appendix IV: Distribution of Sacco Headquarters among Counties

***SACCO Headquarters distribution among countie***

***s***




***Source: SASRA Database***

**Appendix V: Comparative Aggregate Liquidity Levels of DT-SACCOS**

| LIQUIDITY RATIO | Prescribed Minimum | 2016 | 2015 |
|---|---|---|---|
| Liquid Assets/Short Term Liabilities (Liquidity Ratio) | >=15% | 49.95% | 55.90% |
| Liquid Assets/Total Deposits | | 18.05% | 17.18% |
| External Borrowings/Total Assets | <=25% | 5.04% | 5.31% |
| Liquid Assets/Total Assets | | 12.49% | 11.90% |
| Total Loans/Total Deposits | | 108.39% | 108.74% |

## Appendix VI: Digital Sources

http://www.newmilimanisacco.co.ke/wp-content/uploads/2017/08/AGM_MINUTES-2017.pdf

https://www.dimkessacco.co.ke/index.php/downloads/7-audited-accounts-2015/file

https://www.metrosacco.co.ke/component/content/category/2-features.html

http://taisacco.coop/wp-content/uploads/2017/10/2016-Financial-report.pdf

http://taisacco.coop/wp-content/uploads/2015/08/TAI-SACCO-SOCIETY-LIMITED-financials-2015.pdf

## Appendix VII: Observation tables

| **Saccos (Branches)** | **Operational efficiency (Y)** | **Agency Banking (X)** | | | | |
|---|---|---|---|---|---|---|
| | Ratio of Cost recovery (total revenue/income) 2015-2017(Y3) | Liquidity Ratio (Total loans/total deposits)(X1) | Agent banking (Products and Services) (X2) | location based on the number of branches (X3) | Operating hours (X4) | Agent Staff (number per PoS)(X5) |
| **1** | 0.63 | 0.79 | 10 | 13 | 8 | 2 |
| **2** | 0.9 | 0.85 | 10 | 12 | 9 | 1 |
| **3** | 0.8 | 0.95 | 7 | 23 | 10 | 1 |
| **4** | 0.88 | 0.94 | 6 | 25 | 11 | 2 |
| **5** | 0.67 | 0.85 | 8 | 15 | 11 | 1 |
| **6** | 0.45 | 1 | 11 | 13 | 11 | 1 |
| **7** | 0.3 | 1.06 | 13 | 24 | 11 | 2 |
| **8** | 0.42 | 1.05 | 15 | 13 | 8 | 1 |
| **9** | 0.2 | 0.95 | 12 | 23 | 10 | 1 |
| **10** | 0.2 | 0.84 | 8 | 8 | 11 | 2 |
| **11** | 0.12 | 0.79 | 6 | 24 | 8 | 1 |
| **12** | 0.42 | 0.94 | 10 | 12 | 8 | 1 |
| **13** | 0.42 | 0.94 | 15 | 18 | 9 | 2 |
| **14** | 0.47 | 0.95 | 13 | 19 | 9 | 1 |
| **15** | 0.17 | 0.94 | 6 | 8 | 8 | 1 |
| **16** | 0.38 | 1 | 9 | 19 | 8 | 2 |
| **17** | 0.17 | 0.88 | 14 | 9 | 8 | 1 |
| **18** | 0.12 | 1.06 | 14 | 13 | 10 | 1 |
| **19** | 0.6 | 1.12 | 15 | 17 | 10 | 2 |
| **20** | 0.63 | 0.94 | 11 | 20 | 10 | 1 |
| **21** | 0.14 | 1 | 8 | 11 | 8 | 1 |
| **22** | 0.18 | 0.89 | 8 | 16 | 8 | 2 |
| **23** | 0.58 | 0.89 | 14 | 22 | 8 | 1 |
| **24** | 0.21 | 1.05 | 6 | 18 | 8 | 1 |
| **25** | 0.63 | 1.18 | 14 | 10 | 9 | 2 |
| **26** | 0.44 | 1.18 | 7 | 15 | 10 | 1 |
| **27** | 0.06 | 1 | 11 | 24 | 8 | 1 |
| **28** | 0.5 | 0.89 | 9 | 18 | 8 | 2 |
| **29** | 0.22 | 1 | 12 | 23 | 9 | 1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **30** | 0.8 | 0.9 | 10 | 8 | 10 | 1 |
| **31** | 0.21 | 1.06 | 14 | 7 | 10 | 2 |
| **32** | 0.53 | 1 | 7 | 17 | 9 | 1 |
| **33** | 0.33 | 1.05 | 15 | 22 | 11 | 1 |
| **34** | 0.41 | 0.89 | 15 | 20 | 9 | 2 |
| **35** | 0.13 | 0.85 | 6 | 8 | 11 | 1 |
| **36** | 0.07 | 1 | 9 | 15 | 9 | 1 |
| **37** | 0.18 | 0.9 | 7 | 14 | 8 | 2 |
| **38** | 0.64 | 1.06 | 14 | 11 | 11 | 1 |
| **39** | 0.4 | 1 | 7 | 11 | 11 | 1 |

| **Saccos (Branches)** | **Operational efficiency** | **Agency Banking (X)** | | | | |
|---|---|---|---|---|---|---|
| | Profits (Surplus retained from 2015-2017)(Y2) | Liquidity Ratio (Total loans/total deposits)(X1) | Agent banking (Products and Services) (X2) | location based on the number of branches (X3) | Operating hours (X4) | Agent Staff (number per PoS)(X5) |
| 1 | 20,713,134.00 | 0.79 | 10 | 13 | 8 | 2 |
| 2 | 644,000,000.00 | 0.85 | 10 | 12 | 9 | 1 |
| 3 | 25,679,610.00 | 0.95 | 7 | 23 | 10 | 1 |
| 4 | 23,726,096.00 | 0.94 | 6 | 25 | 11 | 2 |
| 5 | 372,096,280.00 | 0.85 | 8 | 15 | 11 | 1 |
| 6 | 71,584,958.00 | 1 | 11 | 13 | 11 | 1 |
| 7 | 15,927,022.00 | 1.06 | 13 | 24 | 11 | 2 |
| 8 | 16,796,117.00 | 1.05 | 15 | 13 | 8 | 1 |
| 9 | 13,167,256.00 | 0.95 | 12 | 23 | 10 | 1 |
| 10 | 18,475,695.00 | 0.84 | 8 | 8 | 11 | 2 |
| 11 | 14,715,387.00 | 0.79 | 6 | 24 | 8 | 1 |
| 12 | 19,323,610.00 | 0.94 | 10 | 12 | 8 | 1 |
| 13 | 10,992,681.00 | 0.94 | 15 | 18 | 9 | 2 |
| 14 | 10,538,202.00 | 0.95 | 13 | 19 | 9 | 1 |
| 15 | 17,044,973.00 | 0.94 | 6 | 8 | 8 | 1 |
| 16 | 18,127,641.00 | 1 | 9 | 19 | 8 | 2 |
| 17 | 14,178,648.00 | 0.88 | 14 | 9 | 8 | 1 |
| 18 | 18,019,660.00 | 1.06 | 14 | 13 | 10 | 1 |
| 19 | 12,766,098.00 | 1.12 | 15 | 17 | 10 | 2 |
| 20 | 14,002,436.00 | 0.94 | 11 | 20 | 10 | 1 |
| 21 | 16,128,401.00 | 1 | 8 | 11 | 8 | 1 |
| 22 | 11,738,629.00 | 0.89 | 8 | 16 | 8 | 2 |
| 23 | 11,179,529.00 | 0.89 | 14 | 22 | 8 | 1 |
| 24 | 14,871,772.00 | 1.05 | 6 | 18 | 8 | 1 |
| 25 | 18,087,853.00 | 1.18 | 14 | 10 | 9 | 2 |
| 26 | 16,658,725.00 | 1.18 | 7 | 15 | 10 | 1 |
| 27 | 13,274,972.00 | 1 | 11 | 24 | 8 | 1 |
| 28 | 11,797,700.00 | 0.89 | 9 | 18 | 8 | 2 |
| 29 | 13,109,311.00 | 1 | 12 | 23 | 9 | 1 |
| 30 | 19,137,211.00 | 0.9 | 10 | 8 | 10 | 1 |
| 31 | 12,599,232.00 | 1.06 | 14 | 7 | 10 | 2 |
| 32 | 11,699,415.00 | 1 | 7 | 17 | 9 | 1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 33 | 12,112,156.00 | 1.05 | 15 | 22 | 11 | 1 |
| 34 | 11,511,502.00 | 0.89 | 15 | 20 | 9 | 2 |
| 35 | 19,157,358.00 | 0.85 | 6 | 8 | 11 | 1 |
| 36 | 18,583,507.00 | 1 | 9 | 15 | 9 | 1 |
| 37 | 10,176,584.00 | 0.9 | 7 | 14 | 8 | 2 |
| 38 | 16,445,131.00 | 1.06 | 14 | 11 | 11 | 1 |
| 39 | 19,724,067.00 | 1 | 7 | 11 | 11 | 1 |

| Saccos (Branches) | Operational efficiency | Agency Banking (X) | | | | |
|---|---|---|---|---|---|---|
| | Customer retention (no of members gained (2015-2017) (Y1) | Liquidity Ratio (Total loans/total deposits)(X1) | Agent banking (Products and Services) (X2) | location based on the number of branches (X3) | Operating hours (X4) | Agent Staff (number per PoS)(X5) |
| 1 | 3,000.00 | 0.79 | 10 | 13 | 8 | 2 |
| 2 | 16,238.00 | 0.85 | 10 | 12 | 9 | 1 |
| 3 | 37,189.00 | 0.95 | 7 | 23 | 10 | 1 |
| 4 | 4,000.00 | 0.94 | 6 | 25 | 11 | 2 |
| 5 | 12,209.00 | 0.85 | 8 | 15 | 11 | 1 |
| 6 | 79 | 1 | 11 | 13 | 11 | 1 |
| 7 | 1,536.00 | 1.06 | 13 | 24 | 11 | 2 |
| 8 | 4,123.00 | 1.05 | 15 | 13 | 8 | 1 |
| 9 | 1,770.00 | 0.95 | 12 | 23 | 10 | 1 |
| 10 | 1,880.00 | 0.84 | 8 | 8 | 11 | 2 |
| 11 | 1,494.00 | 0.79 | 6 | 24 | 8 | 1 |
| 12 | 1,466.00 | 0.94 | 10 | 12 | 8 | 1 |
| 13 | 2,845.00 | 0.94 | 15 | 18 | 9 | 2 |
| 14 | 2,564.00 | 0.95 | 13 | 19 | 9 | 1 |
| 15 | 1,128.00 | 0.94 | 6 | 8 | 8 | 1 |
| 16 | 3,809.00 | 1 | 9 | 19 | 8 | 2 |
| 17 | 4,559.00 | 0.88 | 14 | 9 | 8 | 1 |
| 18 | 4,789.00 | 1.06 | 14 | 13 | 10 | 1 |
| 19 | 1,467.00 | 1.12 | 15 | 17 | 10 | 2 |
| 20 | 4,735.00 | 0.94 | 11 | 20 | 10 | 1 |
| 21 | 3,293.00 | 1 | 8 | 11 | 8 | 1 |
| 22 | 1,680.00 | 0.89 | 8 | 16 | 8 | 2 |
| 23 | 4,655.00 | 0.89 | 14 | 22 | 8 | 1 |
| 24 | 3,139.00 | 1.05 | 6 | 18 | 8 | 1 |
| 25 | 2,091.00 | 1.18 | 14 | 10 | 9 | 2 |
| 26 | 1,766.00 | 1.18 | 7 | 15 | 10 | 1 |
| 27 | 3,527.00 | 1 | 11 | 24 | 8 | 1 |
| 28 | 2,665.00 | 0.89 | 9 | 18 | 8 | 2 |
| 29 | 2,641.00 | 1 | 12 | 23 | 9 | 1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 30 | 4,992.00 | 0.9 | 10 | 8 | 10 | 1 |
| 31 | 3,249.00 | 1.06 | 14 | 7 | 10 | 2 |
| 32 | 2,576.00 | 1 | 7 | 17 | 9 | 1 |
| 33 | 3,703.00 | 1.05 | 15 | 22 | 11 | 1 |
| 34 | 4,956.00 | 0.89 | 15 | 20 | 9 | 2 |
| 35 | 4,190.00 | 0.85 | 6 | 8 | 11 | 1 |
| 36 | 4,886.00 | 1 | 9 | 15 | 9 | 1 |
| 37 | 1,744.00 | 0.9 | 7 | 14 | 8 | 2 |
| 38 | 3,117.00 | 1.06 | 14 | 11 | 11 | 1 |
| 39 | 4,414.00 | 1 | 7 | 11 | 11 | 1 |