

**THE RELATIONSHIP BETWEEN SIZE AND COST EFFICIENCY OF
SACCOS WITH FRONT OFFICE SERVICE ACTIVITY IN KENYA**

BY

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DECLARATION

This research report is my original work and has not been submitted for a degree in any other university or college for examination/academic purposes.

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DEDICATION

I dedicate this research project to my father Eliud Peter, my mum Elizabeth Nyambura, my loving wife and new born baby boy Kyle Karanja, and to my entire family at large.

To members of cooperative societies around the country I dedicate this piece of work to you too as an encouragement in your quest for excellence in the management and performance of your SACCO.

ABSTRACT

Most studies in cost efficiency in the financial services sector have been dominated by commercial Banks with very few having been conducted on other financial services sectors. The objective of the study was to investigate the relationship between size and cost efficiency of SACCOs with Front Office Service Activity in Kenya, this being an important financial services sector that has not been researched on widely. The study used a descriptive and correlation research design. Multiple regression analysis was used to analyze the relationship between efficiency Ratio (ER) as the dependent variable used to measure efficiency, and five independent variables namely; total assets, capital adequacy, management quality, return on assets, and liquidity. Published financial statements from 2008 to 2012 from a random sample of 43 SACCOs from a population of 124 licensed as at 31st December 2012 were used. The findings were that ER has a negative correlation with total assets at -0.308, capital adequacy at -0.007, and return on assets at -0.643, but a positive relationship with both Management quality at 0.087 and liquidity at 0.012. Low ER signifies high efficiency and vice versa, thus all variables with a negative relationship with ER contribute to high efficiency. Further findings were that, the industry efficiency ratio is 0.8095, large SACCOs have a mean efficiency level of 0.7106, small sized at 0.8504 while the least efficient are medium sized at 0.874. The most cost efficient SACCO had a mean ER of 0.3739 and the least had a mean of 1.4743. Findings of the study were consistent with studies by; Rangan et al (1988), Limam (2001), Marsh et al (2003), Kirkpatrick et al (2002), Lyaga (2006) and Kising'u (2007) that large financial institutions are associated with higher efficiency than smaller ones. The study recommends that in the face of the new constitutional dispensation of devolution, large SACCOs should not be split into smaller units at county level since there exists a positive correlation between size and efficiency, small inefficient SACCOs should be merged and that there is great room for managers to improve cost efficiency given the big disparity between the most efficient SACCO, the least efficient and the industry average.

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ABBREVIATIONS

ATM	-	Automatic Teller Machine
BOSA	-	Back office Service Activities
CAMEL	-	Capital Adequacy, Asset Quality, Management, Earnings and Liquidity
CCD	-	Commissioner for Cooperative Development
DEA	-	Data Envelopment Analysis
DFA	-	The Distribution-Free Approach
FDH	-	Free Disposable Hull
FOSA	-	Front Office Service Activity
ICA	-	International Cooperative Alliance
KUSCCO	-	Kenya Union of Savings and credit Cooperative Societies
ROA	-	Return on Assets
SACCO	-	Savings and Credit Cooperative Society
SASRA	-	SACCO Societies Regulatory Authority
SCP	-	Structure –conduct performance
SFA	-	Stochastic Frontier Approach
USD	-	United states dollars
WOCCU	-	World Council of Credit unions

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

In the interest of maximizing share holder value, all profit making enterprises seek to be efficient. Credit unions locally referred to as Savings and credit cooperative societies (SACCOs) while not being purely profit making businesses seek to maximize the economic wellbeing of their members mostly through provision of loans for provident and development purposes. Credit unions are also keen to pay interest on member's deposits as well as dividends on shares, thus the concern with efficiency. The study focused on credit unions in Kenya which operate Front office Services Activities (FOSA), therefore the local reference to credit unions, namely SACCO is used subsequently. The World Council of Credit Unions (WOCCU) is the global trade association and development agency for credit unions and financial cooperatives.

According to WOCCU statistics, as at December 2012 there were 55,952 SACCOs in the world, with a membership of two hundred million people in 101 countries of the world. The total savings were over USD 1.293 trillion, loans were over USD 1.083 trillion, reserves were close to USD 162 billion while total assets were close to 1.694 trillion. In Africa, in the same period there were 20,831 SACCOs, with over 16 million members, savings and shares were over USD 4.8 billion, and loans were over USD 4.9 billion, reserves were close to USD 481 million with total assets being over USD 5.6 billion. In Kenya in the same period, there were 5,000 SACCOs, with over 4.7 million members, savings and shares were close to USD 3 billion, and loans were close to USD 4 billion, reserves were over USD 274 million with total assets being close to USD 4.2 billion.

These figures testify to the significance of SACCOs in the livelihoods of a significant proportion of the world population. Kim et al. (1996) argue that if operational expenses to maintain an organization are excessive relative to the benefits accruing to the stakeholders of the organization, their significance will be reduced, as cited in (Njuguna, 2010), therefore SACCOs must be cost efficient to be of significance to the members.

1.1.1 Size of SACCOs

Widely used measures of a firms' size are total assets and equity. Sanad, Glenn, and Miah (2006), and Hirtle (2007) used total value of loans, total value of deposits and total assets as measures of institution size. Park and Pennacchi (2007) focused on total deposits as a measure of size. According to Kettinger et al. (1994) firm size is commonly measured by gross sales or gross value of Assets. Various studies suggest that firms with higher levels of capital perform better than undercapitalized ones. Staikouras and wood (2003) argue that there exists a positive link between a greater equity and profitability among firms.

Since a big component of the total assets of credit unions are in form of loans the study focused on total assets as obtained from annual financial statement of SACCOs as a measure of size. Hirtle (2007) defines branch network size as the number of full service; permanent branches held by the organization including both stand-alone and in-store branches. Most SACCOs do not have extensive full service branches and therefore the study did not focus on branch network as a key consideration in assessing size.

1.1.2 Efficiency

Within the financial efficiency literature, efficiency is treated as a relative measure, which reflects the deviations from the maximum attainable output for a given level of input (Kwan & Eisenbeis, 2006). Limam (2001) observes that most studies on the efficiency of financial institutions have addressed the issue of efficiency in terms of scale and scope or in terms of cost efficiency or both.

Limam (2001) argues that Scale efficiency addresses the question of whether a firm is operating at the minimum of its long run average cost curve while Scope efficiency focuses on the relative cost of joint production with the cost of producing the same total output in different firms. Scale economies are measured by the percentage change in costs due to proportionate increase in all outputs. Scope efficiency is measured by the difference between the cost of joint production and the sum of producing the different outputs individually. According to Berger et al, (2001) scope efficiency refers to the different types of services offered by firms and their effect on cost of production and ability to raise revenue.

Limam (2001) is of the view that X-efficiency measures the ability of a financial institution to minimize costs and maximize revenues through optimal use and allocation of resources. In terms of costs, inefficiency can arise from two sources, technical inefficiency which arises when given the chosen inputs, output falls short of the ideal and allocative inefficiency, which arises from suboptimal input choices given prices and output. Technical inefficiency (the difference between output and maximal output) is considered 'pure' since the source can be singled out. Cost inefficiency, in contrast, is a blend of the two sources, technical and allocative

inefficiency (Green, 2006). Technical efficiency can be viewed as a way of using minimum inputs to produce a given level of output.

A financial institution is considered technically inefficient if it is using too many inputs to produce a given level of output (Nyhan, 1998). The study used X –efficiency as a measure of cost efficiency, looking at the extent SACCOs incur minimum costs in their operations to produce a given level of output. Farrell (1957) as quoted in Green (2006) argues that one could usefully analyze technical efficiency in terms of realized deviations from an idealized frontier isoquant.

1.1.3 Size of SACCOs and Cost Efficiency

Technical efficiency in SACCO enterprises refers to the extent that SACCOs could reduce input costs for a given level of output (input orientation) or expand output for given levels of inputs (output orientation). The distance to an optimal production or cost frontier measures Technical efficiency. It could be deterministic or stochastic and gives the maximal output that can be attained for a given level of input, or the minimal cost for a given level of output and input prices. The second component of X-efficiency is allocative efficiency. It refers to the possible reduction in cost that SACCOs can attain as a result of using the different inputs in optimal proportions or equivalently to operate on the least cost expansion path (Limam, 2001).

Productivity is closely linked with efficiency. An efficient SACCO is one operating on the production frontier i.e. it is achieving best practice. Rising efficiency therefore implies rising

productivity (Rogers, 1998). Gascon and Adenso-Diaz (1997) pointed out that productivity gains have the potential to contribute to an increase in business profit from their study analyzing Spanish commercial banks for the period 1987-1994.

The relative efficiency hypothesis presupposes that larger firms in terms of assets are more efficient than smaller ones, and are more profitable as a result of their superior efficiency (Clarke et al., 1984). Baumol (1959) propositioned that large firms have all of the options of small firms and in addition can invest in lines requiring such scale that small firms are excluded as cited in Mehrjardi (2012). Studies show there is a positive relationship between size and efficiency of financial institutions. Limam (2001) found that larger bank size, higher share of equity capital in assets and greater profitability are associated with better efficiency. Studies by Kirkpatrick et al (2002) and Kising'u (2007) were consistent with Limam (2001), this study sought to test this relationship in SACCOs. Efficiency is important to members of SACCOs since efficient SACCOs tend to have lower service charges, better loan and deposit rates and better quality services (Limam, 2001).

This study is divided into five chapters, presented as follows: Chapter 1 is the introductory chapter, followed by literature review in chapter two, chapter three covers research methodology, chapter four focuses on data analysis, results and discussions and finally chapter five has the summary, conclusion and recommendations. Section 1.1.4 covers an overview of the SACCO Societies in Kenya. Section 1.2 and 1.3 focus on the research problem and objectives of the study respectively. Section 1.4 discusses the significance of the study

SACCO Societies in Kenya

A co-operative refers to an autonomous association of persons united to meet their common economic, cultural needs and aspirations through a jointly owned and democratically controlled enterprise. The primary objective of a co-operative is to pool the scarce resources, eliminate middle men, and achieve a common interest. People have practiced co-operative ideals for ages especially in Africa; people grazed communally, built houses, engaged in hunting and tilled land together (Sang, 2011). The modern co-operative movements all over the world have their firm base on the principles of co-operative, modeled on the Rochdale pioneer cooperative society, established in the 19th Century (Ouma, 1989). In 1966 the following principles were adopted by the International Cooperative Alliance (ICA): Open and voluntary Membership, Democratic Administration, Members' economic participation, Autonomy and Independence, Education training and information, Co-operation with other co-operatives, and concern for community (Ouma, 1989).

In the course of time cooperative societies have grown in scale and started to engage in quasi Banking activities for income generation. Such activities are carried out under Front office Service Activities (FOSA); these include operation of savings accounts, fixed deposit accounts, Salary processing, giving advances as well as long term loans. These activities were initially not well covered by existing regulatory frame work namely the cooperative Act of 1997 and Cooperative Societies act of (2004). There was therefore a need for further legislation to ensure that SACCOs are well managed and efficient so as to build public confidence in them.

To address this need, and as part of the Government of Kenya financial sector reform, the Sacco Societies Act of 2008 was enacted through an ACT of Parliament to make provision for the licensing, regulation, supervision and promotion of certain Sacco societies and to establish the Sacco Societies Regulatory Authority (SASRA). Subsequently, in 2010 the Sacco societies' regulations were issued and were to take effect from 18th June 2010. An assessment of the relationship between size and Cost efficiency of the regulated SACCOs thus becomes of paramount importance so as to help evaluate how well the SACCOs are helping in maximizing members' value.

As of December 2011, there were 110 deposits taking SACCOs under SASRA supervision, these are SACCOs that operate FOSA. These can be classified into three broad categories. The categories are based on the average market share comprising capital size, deposits, total loans and assets size. The first Category comprises of SACCOs with assets above Ksh 1 billion. As at 31st December 2011, there were 43 large SACCOs with an average market size of 85.5% of the licensed SACCOs total assets. The second category comprises of SACCOs whose assets are more than Ksh.200 million but less than Ksh.1billion. There were 43 SACCOs in this category with an average market size of 13% in terms of total assets. The third Category comprises of SACCOs with asset base of less than Ksh.200 million, there were 24 licensed SACCOs in this category representing about 2% of the market size (The SACCO supervision report, 2011).

Cooperatives can broadly be categorized as: Financial Co-operatives (Savings & Credit Co-operative Societies-SACCOs) and Non-financial Co-operatives (includes produce marketing, housing, transport and investment co-operatives) Financial co-operatives or SACCOs are formed by individual members with the primary purpose of pooling savings and lending to each

other as per the registered Bylaws. SACCOs further comprise both deposit and non-deposit taking. In the current legal framework a Deposit Taking Sacco is that SACCO operating FOSA. A FOSA activity is a quasi-banking activity undertaken by licensed SACCOs. SACCOs as financial institutions play an important role of financial intermediation in Kenya's financial landscape focusing mostly on personal development, small and micro enterprise sector of the economy (SASRA Annual report, 2011).

All savings and Credit cooperative societies are affiliated to a national apex body called Kenya Union of Saving and credit Cooperative Societies (KUSCCO). SACCO subsector is the fastest growing within the Cooperative sector accounting for over 50% of the registered cooperative societies. According to the Kenya Financial Stability report 2011 SACCOs operating FOSA control 79 % of total Savings held by SACCOs.

To enhance efficiency, SACCOs in Kenya have continued to adopt technological innovation, in the form of improvements in communication and data processing as well as technologically supported products such as mobile Banking and connectivity to automatic Teller Machines (ATMs). The use of mobile phone platform to deliver financial services has seen software vendors in the Sacco subsector partner with the mobile service providers to integrate mobile solutions to their core systems. Using this platform nearly all Deposit Taking SACCOs are now able to have their members withdraw or deposit money in to the FOSA account, make enquiries on the accounts, get notifications on their loans as well as pay their bills (SACCO Supervision annual report, 2011).

All these developments suggest that increased productivity is a core objective of SACCOs and that utilizing resources in an efficient and effective manner is of utmost importance to SACCO business success. It is expected that adoption of technology and growth in size leads to economies of scale and thus cost efficiency, this research therefore sought to provide empirical evidence on this relationship in the SACCO sector in Kenya.

1.2 Research Problem

According to the Kenya Financial Stability report 2011, SACCOs have continued to play a critical role in Kenya's financial sector in terms of access, savings mobilization and wealth creation. They represent a considerable part of the Kenya financial sector; they are member-based organizations focusing on meeting financial needs of members for personal and enterprise development. Membership cuts across different economic activities, both in rural and urban areas and is engaged either in back office service activities (BOSA) or the FOSAs, or both. Lyaga (2006) observes that an efficient and smoothly running payment system is a necessary precondition for business development not only in Kenya but the whole world at large. SACCOs as major players in the payment system in Kenya thus play an important role in the economic development of the country and are renowned for provision of credit at lower rates than mainstream commercial Banks.

Several studies on cost efficiency of Commercial banks around the world have been conducted. In Africa, Ikhide (2000) studied X-efficiency of commercial banks in Namibia, in European countries such as Germany, Italy, Netherlands, Switzerland and UK studies were conducted by Berger et al (2001). In the United States (US) studies by Rangan et al (1988), in China by Yao and Han (2007), in Hong Kong by Kwan (2001) and in Kuwait by Limam (2001). Locally

several studies have been conducted on cost efficiency in Commercial Banks as well, such as Kirkpatrick et al (2002) , Mutanu (2002), Lyaga (2006) Kising'u (2007) and Kongiri (2012).

Some of the local studies on cost efficiency in Commercial Banks have however had contradictory results. Lyaga (2006) found evidence that the average small bank is relatively more inefficient than the average large bank while Mutanu (2002) found that the low capitalized banks were more efficient than highly capitalized banks. Studies in other sectors of the economy have been conducted as well such as Njuguna (2010) who studied the Impact of retirement benefits regulations on the cost efficiency of retirement benefits schemes in Kenya, Kubai (2011) studied X-Efficiency of Insurance companies in Kenya and Njenga (2012) studied the Relationship between Cost efficiency and Financial performance of companies listed at the Nairobi Securities Exchange.

The researcher had however not encountered studies on cost Efficiency and size in SACCOs with FOSAs in Kenya. Given the significant role played by SACCOs with FOSAs in savings mobilization in the country, provision of credit for provident and development purposes to their members and the now very important role in the National payment system, the study was aimed at filling the research gap on Cost Efficiency in this very important Sector of the Kenyan Economy. The study provides further empirical evidence on the relationship between size and cost efficiency given the contradictory empirical evidence from local studies within the financial sector. The study looked at the relationship between Size and Cost Efficiency of SACCOs with FOSAs in Kenya, which fall under SASRA regulation. Focus was put on cost efficiency. The study was based on the hypothesis that there exists a positive relationship between size and cost efficiency of SACCOs in the country. The research therefore sought to

answer the question, what is the relationship between size and cost efficiency of SACCOs with FOSA in Kenya?

1.3 Research Objectives

The objective of the study was to establish the relationship between size and cost efficiency of SACCOs with FOSAs in Kenya.

1.4 Value of the Study

1.4.1 Policymakers

Policy makers will be able to formulate policy on whether small SACCOs should merge to take advantage of economies of scale. The study will also guide in making a decision on whether to retain SACCOs with a National outlook in the face of the new dispensation of devolving governance to the counties which may call for breaking up of National SACCOs in to smaller units at county level.

1.4.2 Sacco Managers

The managers will be able to know whether economies of scale exist in the SACCO sector and thus make decisions on whether to expand their branch net work as well as whether to increase the number of product offerings. The study also provides SACCO managers with a framework to assess whether they are running their SACCOs in a cost efficient manner by providing the mean industry ER as well as the most and least ER levels in the sector.

1.4.3 Academicians

The research findings add to the wealth of knowledge on cost efficiency in the financial services sector as well as provide empirical evidence on size and efficiency specifically in SACCOs as business enterprises. This study provides a foundation for further research on cost efficiency in the SACCO sector.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents theories surrounding the study of efficiency in Financial Institutions and also reviews empirical literature related to cost efficiency and size as presented by various researchers, scholars, analysts and authors both globally and locally. The conceptual framework informed by review of the literature is also considered. The chapter is organized as follows: Section 2.2.0 presents the theoretical review, Section 2.3 presents empirical studies and finally section 2.4 presents the summary of literature review.

2.2.0 Theoretical Review

2.2.1 Market Power Theories

According to Berger (1995) market power theories include two hypotheses namely the traditional structure –conduct performance (SCP) and the relative –market power hypothesis. SCP is defined as the relationship between market structure, firm conduct and firm performance. It assumes that the existence of entry barriers is the major determinant of firm's profits. Greater costs of entry make it easier for existing firms to maintain monopoly profits. New entrants reduce the level of profits. Market concentration decreases the cost of collusion between firms and results in abnormal profits for existing firms in the market. The relative market power hypothesis asserts that only firms with large market shares have the power to set prices and thus earn supernormal profits. Firms with smaller market shares are forced to operate as if under perfect competition and are unable to earn the same supernormal profits.

The SCP is the most tested hypotheses in the industrial organizations literature. Empirical studies on the performance of the banking industry have focussed on the standard analysis of

the relationship between market structure and bank performance. Kaufman (1966) researched Iowa banking market from 1959-1960 and found statistically significant strong positive relationship between concentration level of the market and performance of banks operating in that market. From his research he suggested that the relationship between market concentration and bank profitability is of non linear form.

Rhoades (1985) surveyed all the studies released before 1982. Fifty three out of Sixty five empirical tests confirmed the theory about existence of positive relationship between market concentration and bank profitability. In concurrence with Kaufman (1966) a weak relationship was observed in all the cases. Smirlock (1985) had conflicting results and found insignificant relationships between the measures of market structure and bank performance.

2.2.2 The Efficient Structure Theories

Thoraneenitiyan (2010) observes that Financial institution efficiency studies focus on scale and scope efficiency, others examine X-efficiency or frontier. The X-efficiency hypothesis argues that financial institutions with better management and practices control costs and increase profit, moving the firms to best-practice, lower bound cost curve. The scale-efficiency hypothesis argues that financial institutions achieve better scale of operation and thus lower costs. Lower costs lead to higher profit and faster growth for the scale-efficient banks.

Berger (1995) criticizes most prior tests of Market-power theories since they do not control for efficient structure theories. He provides a simultaneous test for the four competing hypotheses. Two market power hypotheses and two efficient structures by adding measures of X-efficiency and scale efficiency to the standard tests. He found support for only two of the four hypotheses-

the relative market –power and the X-efficiency hypotheses. His evidence does not support the SCP and scale –efficiency hypotheses. Smirlock (1985) tested the efficient structure theory using data set of over 2700 banks and found no relationship between market concentration and bank profitability, a significant positive correlation between bank profitability and market share was present.

2.2.3 Expense –Preference Behaviour Theory

In Market power theories and the efficient –structure theories, profitability of financial institutions is taken as a proxy for performance. Alternative theories have other factors other than profitability as measures of performance. Expense-preference behaviour theory was developed by Williamson in 1963 and refined by Rees (1974). This theory posits individual preferences of managers of a firm as utility maximizing, as opposed to profit maximizing. It predicts that under conducive circumstances such as the separation of ownership and control, costly monitoring of managerial behaviour, a lack of effective competition in input and output markets, or effective regulation in those markets, managers spend more on other prerequisites than is consistent with profit maximization behaviour (Gropper & Oswald, 1996)

Edward (1977) carried out the first empirical work on the Expense Preference theory. Using aggregated bank data for 44 banks in 1962 and 1964 and total wages and salaries, total employees as dependent variables, he found the coefficient on the three bank concentration ratio to be positive and significantly correlated with both the bank’s total labour force and the banks total wage bill. He drew the conclusion that expense preference behaviour is a significant force that detracts from profit maximization in many Banks. Other empirical works consistent with this view include Hannan (1979) and Arnould (1985)

2.3 Empirical Studies

Numerous studies have been conducted on cost efficiency in financial institutions across the world; however most of the studies have been based on the US commercial banks followed by European banks. There are only few studies on financial institution's efficiency in less developed countries (Kosak and Zajc, 2004).

Rangan et al (1988) conducted a study on technical efficiency of a sample of U.S. banks using a non-parametric frontier approach and regression analysis. The results indicated that the banks could have produced the same level of output with only 70% of the inputs actually used. In addition, most of this inefficiency was found to be due to pure technical inefficiency (wasting inputs) rather than scale inefficiency (operating at nonconstant returns to scale). Regression analysis showed that the technical efficiency of the banks is positively related to size, negatively related to product diversity, and not at all related to the extent to which branch banking is allowed. Marsh et al (2003) estimated technical efficiency on commercial banks regulated by the US Federal Reserve System for the year 1990 to 2000 using a Bayesian variation of a stochastic frontier model. The results indicated that technical inefficiency was decreasing over time and that larger banks are more efficient than smaller banks.

Ikhide (2000) studied Namibia's bank efficiency for period from 1996 to 1998 using Econometric cost Frontier approach and operating ratios. The study found that commercial Banks were not producing at the point of minimum average cost and suggested that banks can further lower their operating costs as they expand output. Profitability measures by gross margins, return on assets and return on equity ratios were not highly correlated with operating costs.

Limam (2001) estimated technical efficiency of Kuwaiti Banks using a stochastic cost frontier approach. Earning assets represented output and fixed assets, labour and financial capital were the inputs. The study found that banks produce earning assets at constant returns to scale and hence have less to gain from increasing scale of production notably, through merging with other banks, than from reducing their technical inefficiency. Except for the largest two banks, the study found that there was a large room for improving technical efficiency of most of the banks. The study showed that larger bank size, higher share of equity capital in assets and greater profitability are associated with better efficiency.

Yao and Han (2007) analyzed the efficiency of 15 large commercial banks in China during the period 1998-2005 employing a parametric approach. The results showed that Chinese Commercial banks do not have substantial differences in technical efficiency. Although the average scores of efficiency were high, the aggregate gaps in technical efficiency were found to be low at only 15%. The results also showed that the big four banks were able to improve total factor productivity mainly through improving technical efficiency, instead of technological progress.

Kirkpatrick et al (2002) used the translog stochastic cost and profit frontier approach to measure the degree of x-inefficiency in a panel of 89 commercial banks drawn from nine Sub-Saharan African countries, covering the period 1992-99. The study modeled the determinants of x-inefficiency in terms of bank-specific factors and general macroeconomic variables. Kirkpatrick et al (2002) found that profit x-inefficiency is slightly higher than cost x-inefficiency, which suggests that revenue x-inefficiency is rather small. The evidence also shows that the degree of cost x-inefficiency is exacerbated by bad loans, high capital ratios and

financial liberalization. In contrast, it is shown that larger banks are more efficient and the level of foreign bank penetration reduces x-inefficiency.

Kising'u (2007) studied the relationship between technical efficiency of commercial banks in Kenya and managerial skills namely education, experience in years and frequency of training. The study also examined the substitution possibilities between a manager's level of education and years of experience in relation to technical efficiency. The hypotheses of the study were that a positive relationship exists between managerial skill characteristics and technical efficiency and that there are substitution possibilities between years of experience and education level. The study was based on a sample of 39 banks and used a stochastic production frontier and regression analysis to test the relationship.

Kising'u (2007) found that there is a positive relationship between technical efficiency and the level of education, years of experience, and frequency of training. The results also indicated that larger bank size, higher capitalization and greater profitability are associated with higher technical efficiency. Further there were no substitution possibilities between a manager's level of education and years of experience in relation to technical efficiency. The study concluded that, banks ought to appoint managers with high levels of education and experience and improve them through continuous training as this leads to higher technical efficiency.

Lyaga (2006) studied the X-efficiency of 33 commercial banks in Kenya and employed the Stochastic Econometric Cost Frontier Analysis. The study found that the level of X-efficiency in Kenya's commercial banks is 18%. Evidence was found that the average small bank is relatively more inefficient than the average large bank. Mutanu (2002) investigated the

efficiency scores of highly and lowly capitalized banks. The study employed the efficient cost frontier approach. Based on a sample of eight quoted commercial banks, it was found that the low capitalized banks were more efficient than highly capitalized banks.

Kongiri (2012) studied effects of CAMEL variables on Bank Efficiency of 37 Kenyan commercial Banks. The study used multiple linear regressions to analyze the data. The study found that medium sized banks were more efficient than large and small sized banks. Further the study found that capital adequacy, Earnings and Liquidity ratio have a negative relationship to efficiency ratio (ER) while management quality and asset quality have a positive relationship. The study suggested that regulatory authorities should find an optimal point on regulatory capital adequacy ratio and liquidity ratio at which level banks would not be holding on too much capital and liquidity without compromising on their efficiency.

Several studies have employed regression analysis to test the relationship between size and cost efficiency in financial institutions as observed in Rangan et al (1988) and, Kongiri (2012). Brooks (2008) argues that regression analysis is the most important tool at the econometrician's disposal. It is concerned with describing and evaluating the relationship between a given variable and one or more other variables. It can be viewed as an attempt to explain movements in a variable by reference to movements in one or more other variables (Brooks, 2008). This technique was used to test the relationship between size and cost efficiency of SACCOs with FOSAs in Kenya. Efficiency ratio is the dependent variable and the independent variables comprise of total assets (Proxy of Size) while capital adequacy, management quality (Staff costs), return on assets (ROA) and liquidity are control variables.

2.4 Summary of Literature Review

Findings in global and regional studies in Rangan et al (1988), Limam (2001), Marsh et al (2003), and Kirkpatrick et al (2002), were consistent in their findings that large banks are more efficient than small banks. Local studies on cost efficiency by Lyaga (2006) Kising'u (2007) were consistent with findings of previous foreign countries that large bank size is associated with higher efficiency than smaller bank size. Findings in Mutanu (2002) that the low capitalized banks were more efficient than highly capitalized banks were however in conflict with most of the studies both globally and locally. As can be noticed commercial banks have dominated studies on cost efficiency within the financial institutions sector, further even though most of the studies are consistent in their findings there is conflict on the relationship between size and efficiency as evidenced by Mutanu (2002) & Kongiri (2012).

Literature indicates that Hays, et al (2009) ER is a fundamental ratio in evaluating financial institution efficiency and was noted to have been used locally in Kongiri (2012). Koch and Scott MacDonald (2003) as cited by Forster and Shaffer (2005) state that ER is considered the most popular ratio to evaluate a financial institutions performance because it reflects operations both on and off the balance sheet. In view of this, the study used ER as a proxy for efficiency in SACCOs. The study therefore sought to provide more empirical evidence in view of the conflict from existing studies on the relationship between size and cost efficiency. The study extended research into other financial services sectors namely SACCOs as Commercial banks dominated existing studies on the relationship between size and cost efficiency.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides details on the research design, the population upon which the sample was selected, the sampling technique adopted, type of data used whether primary, secondary or both. The chapter further provides details on the method of data analysis that will be used and details how validity and accuracy of the data will be ensured.

3.2 Research Design

Research design refers to the method used to conduct the research; it is the conceptual structure within which research is conducted. This study evaluates the characteristics of the sample subjects with respect to cost efficiency as determined by the related variables. Such a study where characteristics of various items are considered is referred to as a descriptive study (Kothari, 2004).

3.3 Population

All items in any field of inquiry constitute a population, Kothari (2004). A population consists of a set of individuals, objects with some common observable characteristics that are distinct from other populations. The population in this study consisted of the 124 deposit taking SACCOs licensed by SASRA as at 31st December 2012.

3.4 Sampling

This study adopted Probability sampling techniques; these minimize bias in sample selection by ensuring that all elements in the population have some predetermined chance of being selected. The study applied the stratified sampling technique from which Systematic Sampling was

employed. Systematic Sampling involves drawing every n^{th} element in the population, n^{th} is therefore the systematic interval. In this research n^{th} item is 3 which led to a sample size of 45. The first item was selected randomly from the first three items and thereafter every n^{th} was automatically included (Kothari, 2004).

The strata was based on the three categories of SACCOs outlined in chapter one. Each stratum was made of 41 elements from which three samples each of 15 subjects were selected thus the entire sample consisted of 45 SACCOs. A sample size of 45 was considered quite representative given that the population was 124 SACCOs. 45 SACCOs constitute 36 % of the entire population. In selecting this sample cost and time constraints were taken into account, the need for high precision, the population which is relatively large and possible scope of variability in the population. The researcher believes that a sample size of 45 put all these factors into consideration.

3.5 Data Collection

Data collected was secondary data, consisting of published financial statements for 2008 to 2012. Data for 2008 & 2009 was sourced from the office of the Commissioner for cooperative development (CCD) as all SACCOs were filing their annual returns with CCD. SACCOs with FOSA started filing their annual returns with SASRA in 2010, and therefore financial statements for 2010 to 2012 were obtained from SASRA.

3.6 Data Analysis

According to Cooper and Schindler (2003) the whole process which starts immediately after data collection and ends at the point of interpretation and processing data is data analysis. To test the relationship between size and cost efficiency of SACCOs with FOSAs in Kenya a multiple linear regression model was employed and a computer package SPSS (Statistical package for Social Sciences) version 16 was used to solve the regression Equation used in the study. The results are presented in tables and graphs where necessary.

3.6.1 Analytical Model

Based on the literature reviewed, the variables of the study comprised of the efficiency ratio (ER) of SACCO_{it}, as the dependent variable and the independent variables comprised of total assets (Proxy of Size), capital adequacy, management quality, return on assets (ROA) and Liquidity. Since management is usually assigned a composite score by the supervising authorities the study adopted the Hays, et al (2009) ratio of salaries and benefits to average assets as a proxy for management. Hays et al (2009) assert that salaries and benefits are generally the largest non-interest expense elements of a financial institution's overhead that are controllable by management. ER as defined by Hays, et al (2009) was used to measure efficiency. Hence the following regression Model was applied; the model is extended from Kongiri (2012).

$$Eff_{it} = \alpha + \beta_1 LnTA + \beta_2 c_{it} + \beta_3 Mgt_{it} + \beta_4 ROA_{it} + \beta_5 Liq_{it} + \varepsilon_i$$

Where;

$$ER = \frac{\text{Non Interest Expense}}{\text{Non interest Income} + \text{Net Interest Income}} = Eff_{it}$$

Eff_{it} = Efficiency ratio of SACCO i at time t

α = Constant

LnTA = Natural log of Total Assets (Applied to standardize the value of Total Assets)

$c_{it} = \frac{\text{Total Equity}}{\text{Average Assets of SACCO } i \text{ at time } t}$

$Mgt_{it} = \frac{\text{Salaries and benefits}}{\text{Average Assets of SACCO } i \text{ at time } t}$

$ROA_{it} = \frac{\text{Net Profits}}{\text{Average Assets of SACCO } i \text{ at time } t}$

$Liq_{it} = \frac{\text{Net Liquid Assets}}{\text{Total Deposits of SACCO } i \text{ at time } t}$

ε_i = Error Term

Coefficients $\beta_1, \beta_2, \beta_3, \beta_4$ & β_5 were used to measure the sensitivity of the dependent variable (Eff_{it}) to unit changes in the five explanatory variables. F-Statistic and t-Statistics were used to carry out tests of significance, for the overall fit of the Model (R^2).

Pearson correlation coefficients were used to test for Multicollinearity.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents data analysis, findings and discussions of the research findings based on the research objective. Secondary data from published annual financial statements of 43 SACCOs with front office Services Activities for period from 2008 to 2012 was used. Published Financial statements for 2008 and 2009 were filed with the commissioner for cooperative development and subsequently from 2010 to 2012 with SASRA from where they were obtained. Results have been presented in form of summary tables. Financial statements of 43 SACCOs were obtained out of a sample of 45 and observation for five years were available for 41 SACCOs while 2 SACCOs had filed returns for 4 years in the target period. The overall response rate was therefore 95%. The data was analyzed using descriptive analysis, correlation analysis and multiple linear regression analysis to answer the research question using SPSS version 16.

4.2. Descriptive Analysis Results

The results (table 4.1) indicate that a total of 213 occurrences of each variable were used in the study. An overall industry efficiency ratio (ER) of 80.95% was obtained. ER as defined by Hays et al (2009) was used to measure efficiency, ER is defined as a ratio that measures the level of non-interest expense needed to support one dollar of operating revenue, consisting of both interest income and non-interest or fee income and provides for its calculation by dividing overhead expenses by the sum of net interest income and non-interest or fee income. The ratio was thus computed as follows;

$$ER = \frac{\text{Non Interest Expense}}{\text{Non interest Income} + \text{Net Interest Income}}$$

The industry mean natural log of total assets (TA), the proxy for size was 8.6709, industry mean for capital adequacy (C) was 15.38%, mean for management quality (Mgt) represented by staff costs was 3.35%, mean return on assets (ROA) was 2.02% and mean liquidity (Liq) was 17.1 %.

Table 4.1: Descriptive Statistics SACCO Industry

	Mean	Std. Deviation	N
Efficiency Ratio	0.8095	0.2715	213
Natural log TA	8.6709	0.6880	213
Capital Adequacy	0.1538	0.1575	213
Management quality	0.0335	0.0398	213
Return on Assets	0.0202	0.0282	213
Liquidity	0.1710	0.2283	213

Source: Research Data

The results in table 4.2 to 4.4 are descriptive statistics of SACCOs based on three broad categories as discussed in chapter one. The categories are based on the average market share comprising capital size, deposits, total loans and assets size. The first Category comprised of SACCOs with assets above Ksh 1 billion. As at 31st December 2011, there were 43 large SACCOs with an average market size of 85.5% of the licensed SACCOs total assets. The second category comprised of SACCOs whose assets are more than Ksh.200 million but less than Ksh.1billion. There were 43 SACCOs in this category with an average market size of 13% in terms of total assets. The third Category comprises of SACCOs with asset base of less than Ksh.200 million, there were 24 licensed SACCOs in this category representing about 2% of the market size (The SACCO supervision report, 2011).

The results (table 4.2) indicate that a total of 74 occurrences of each variable of large sized SACCOs were used in the study. The results show that an overall large sized SACCO's ER of

71.06% was obtained. The large sized SACCO's mean natural log for TA was 9.4681, sub sector mean for capital adequacy (C) was 14.13%, mean for management quality (Mgt) was 2.46%, mean ROA was 1.072% and mean liquidity (Liq) was 10.27 %.

Table 4.2: Descriptive Statistics Large SACCOs

	Mean	Std. Deviation	N
Efficiency Ratio	0.7106	0.19361	74
Natural log TA	9.4681	0.39415	74
Capital Adequacy	0.1413	0.20608	74
Management cost	0.0246	0.03947	74
Return on Assets	0.0172	0.01565	74
Liquidity	0.1027	0.11787	74

Source: Research Data

The results (table 4.3) indicate that a total of 69 occurrences of each variable of medium sized SACCOs were used in the study. The results show that an overall medium sized SACCO's ER of 87.4% was obtained. The medium sized SACCO's mean natural log for TA was 8.5206, sub sector mean for capital adequacy (C) was 13.28%, mean for management quality (Mgt) was 4.23%, mean ROA was 1.54% and mean liquidity (liq) was 20.23 %.

Table 4.3: Descriptive Statistics Medium SACCOs

	Mean	Std. Deviation	N
Efficiency Ratio	0.874	0.16197	69
Natural log TA	8.5206	0.25947	69
Capital Adequacy	0.1328	0.08916	69
Management quality	0.0423	0.05034	69
Return on Assets	0.0154	0.019	69
Liquidity	0.2023	0.2662	69

Source: Research Data

The results (table 4.4) indicate that a total of 70 occurrences of each variable of small SACCOs were used in the study. The results indicate that an overall small SACCO's ER of 85.04 % was obtained. The small SACCO's mean natural log for TA was 7.9764, sub sector mean for capital adequacy (C) was 18.78 %, mean for management quality (Mgt) was 3.42 %, mean ROA was 2.8% and mean liquidity (Liq) was 21.23 %.

Table 4.4: Descriptive Statistics Small SACCOs

	Mean	Std. Deviation	N
Efficiency Ratio	0.8504	0.38032	70
Natural log TA	7.9764	0.17321	70
Capital Adequacy	0.1878	0.1471	70
Management quality	0.0342	0.02357	70
Return on Assets	0.028	0.0416	70
Liquidity	0.2123	0.26051	70

Source: Research Data

The results from (table 4.1 to table 4.4) indicate that the mean efficiency ratio was lowest for large sized SACCOs, since the lower the efficiency ratio the more efficient a financial institution is, large sized SACCOs in the research period were more efficient than both medium sized and small sized SACCOs.

The result (appendix 3) show the rankings of ER based on mean values for 5 years for the 43 SACCOs sampled. The two most cost efficient SACCOs were Mombasa port and Mwalimu SACCO both in large size category with an efficiency ratio of 0.3739 and 0.499 respectively. The two least cost efficient SACCOs were Orthodox and Fariji with an ER of 1.4743 and 1.3384, both were in the small Size category.

4.3 Correlation Analysis

Table (4.5) depicts the correlation results for the dependent and independent variables. The results indicate a strong negative correlation between the ER and the natural log of TA the proxy for Size, capital adequacy and ROA at, -0.236, -0.113 and -0.606 respectively. A strong positive correlation between the ER and management quality (Mgt) a proxy for staff cost (0.166) was observed while a weak positive correlation with liquidity (0.039) was observed.

The results in Table 4.5 also show the correlation relationship between the independent variables. TA and liquidity were negatively correlated at -0.209, capital adequacy had a strong positive correlation with liquidity at 0.309. Management quality was observed to have a strong positive correlation with liquidity of 0.311; ROA had a positive correlation with capital adequacy of 0.253 while liquidity had a weak positive correlation with ROA of 0.097.

Table 4.5: Correlation Statistics for Dependent and independent variables.

		Efficiency Ratio	Natural log TA	Capital Adequacy	Management quality	Return on Assets	Liquidity
	Correlations						
Pearson Correlation	Efficiency Ratio	1	-0.236	-0.113	0.166	-0.606	0.039
	Natural log TA	-0.236	1	-0.143	-0.153	-0.134	-0.209
	Capital Adequacy	-0.113	-0.143	1	0.102	0.253	0.309
	Management quality	0.166	-0.153	0.102	1	-0.045	0.311
	Return on Assets	-0.606	-0.134	0.253	-0.045	1	0.097
	Liquidity	0.039	-0.209	0.309	0.311	0.097	1
Sig. (1-tailed)	Efficiency Ratio	.	0	0.05	0.008	0	0.287
	Natural log TA	0	.	0.019	0.013	0.026	0.001
	Capital Adequacy	0.05	0.019	.	0.07	0	0
	Management quality	0.008	0.013	0.07	.	0.258	0
	Return on Assets	0	0.026	0	0.258	.	0.078
	Liquidity	0.287	0.001	0	0	0.078	.
N	Observations	213	213	213	213	213	213

Source: Research Data

4.4 Regression Analysis Results

The relationship between size and cost efficiency of SACCOs with FOSAs in Kenya was investigated using multiple linear regression analysis. The results are as presented in table 4.6 below. The study established an industry model for SACCOs with FOSAs in Kenya as follows.

$$Y=1.967-0.308 X_1-0.007X_2+0.087X_3 -0.643X_3 + 0.012X_4$$

From the regression equation established, taking all variables at Zero inefficiency ratio will be positive at 1.967. At 5% level of significance and 95% level of confidence, the researcher established that Total Assets (TA), was highly significant, capital adequacy was significant at 0.893, management quality was significant at 0.106, return on assets was highly significant, and liquidity was significant at 0.826.

Table 4.6: Regression Results for Dependent and Independent Variables

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		
	B	Std. Error	Beta			Lower Bound	Upper Bound	
1	(Constant)	1.967	0.184		10.669	0	1.603	2.33
	Natural log TA	-0.121	0.021	-0.308	-5.908	0	-0.162	-0.081
	Capital Adequacy	-0.013	0.094	-0.007	-0.134	0.893	-0.198	0.172
	Management quality	0.591	0.364	0.087	1.624	0.106	-0.126	1.308
	Return on Assets	-6.197	0.505	-0.643	12.277	0	-7.192	-5.202
	Liquidity	0.015	0.066	0.012	0.221	0.826	-0.116	0.146

a. Dependent Variable: Efficiency Ratio

Source: Research Data

4.4.1 Efficiency Ratio and Total Assets

From table 4.6 above the research established that there is a negative relationship between Efficiency ratio and total assets of -0.308. This means that the higher the total assets value the lower the efficiency ratio, since the lower the efficiency ratio the higher the level of efficiency, there is a positive relationship between a bigger SACCO in size as measured with total assets and the level of efficiency. This finding was consistent with Limam (2001).

4.4.2 Efficiency Ratio and Capital Adequacy

From table 4.6 above the research established that there is a weak negative relationship between Efficiency ratio and capital adequacy of -0.007. This means that the higher the total equity in a SACCO's assets, the lower the efficiency ratio, since the lower the efficiency ratio the higher the level of efficiency, there is a weak positive relationship between a high equity level in a SACCO and the level of efficiency. This finding was consistent with Limam (2001) findings that a higher share of equity capital in assets is associated with better efficiency.

4.4.3 Efficiency Ratio and Management quality

From table 4.6 above the research established that there is a positive relationship between Efficiency ratio and Management quality of 0.087. This means that the higher the staff costs the higher the efficiency ratio, since the higher the efficiency ratio the higher the level of inefficiency, there is in effect a negative relationship between a higher staff costs and the level of efficiency, this finding was consistent with Kongiri (2012).

4.4.4 Efficiency Ratio and Return on Assets

The results in table 4.6 show that the research established that there is a strong negative relationship between Efficiency ratio and return on assets of -0.643. This means that the higher the return on assets the lower the efficiency ratio, since the lower the efficiency ratio the higher the level of efficiency, there is thus a strong positive relationship between a high return on assets and the level of efficiency. This finding was consistent with Limam (2001).

4.4.5 Efficiency Ratio and liquidity

Findings from table 4.6 above show that the research established a positive relationship between the efficiency ratio and liquidity of 0.012, the relationship is however noted to be weak. This means that the higher the liquidity level, the higher the efficiency ratio, since the higher the efficiency ratio the higher the level of inefficiency, there is a negative relationship between a liquidity level and the level of efficiency, this finding was inconsistent with Kongiri (2012) who found a negative relationship between ER ratio and liquidity, however Kongiri (2012) observed that there is an optimal liquidity level above which a financial institution would be inefficient, this explains the weak positive relationship with ER observed in SACCOs.

4.5 Robustness of the Study Model.

Robustness of the model was tested by testing the ‘goodness of fit’ of the model to the actual data and the extent to which the independent variables explained the variation in the dependent variables. Table 4.7 shows that the adjusted R^2 , the coefficient of determination measuring the proportion of variation in ER is 0.466, this means that about 46.6 % of variation in the dependent variable in the regression model are due to the independent variables while 53.4% are due to chance, error term or are unexplained.

Table 4.7 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.692a	0.478	0.466	0.198454	0.478	37.966	5	207	0
a.Predictor:(Constant), Liquidity, Return on Assets, Natural log TA, Management quality, Capital Adequacy b.Dependent Variable: Efficiency Ratio									

Source: Research Data

4.6 ANOVA Model Analysis

Table 4.8 shows that the F- statistics is 37.966 and is highly significant. Thus the independent variables in the model jointly influence ER. The model was therefore considered robust or fitted well with the actual data of the variables.

Table 4.8: ANOVA Model Analysis

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.476	5	1.495	37.966	.000a
	Residual	8.152	207	0.039		
	Total	15.629	212			
a. Predictors: (Constant), Liquidity, Return on Assets, Natural log TA, Management quality, Capital Adequacy						
b. Dependent Variable: Efficiency Ratio						

Source: Research Data

4.7 Discussion of Data analysis and Results

Financial statements of 43 SACCOs were obtained out of a sample of 45 and observations for five years were available for 41 SACCOs while 2 SACCOs had filed returns for 4 years in the target period. The overall response rate was therefore 95%. The data was analyzed using descriptive analysis, correlation analysis and multiple linear regression analysis to answer the research question using SPSS version 16. The study established an industry ER of 80.95%, the smaller the ratio the more efficient a financial institution is. Large SACCOs emerged the most efficient at ER of 71.06% followed by Small Sized SACCOs at 85.04% with the least efficient SACCOs being medium sized at 87.4%.

There was a big disparity between the industry ER of 80.95% and both the most efficient SACCO and the least efficient SACCO. The most cost efficient SACCO was Mombasa port in large sized category with an efficiency ratio of 37.39% and the least cost efficient SACCOs was Orthodox in the small Size category at efficiency ratio of 147.43%. This implies that the management across the SACCO sector apart from the most efficient SACCO has a big room for

improvement in managing controllable costs, towards the feasible ER level of 37.39% of the most efficient SACCO.

The study established that ER has a negative correlation with total assets at -0.308, capital adequacy at -0.007, and return on assets at -0.643, but a positive correlation with both Management quality at 0.087 and liquidity at 0.012. Low ER signifies high efficiency and vice versa, thus all variables with a negative relationship with ER contribute to high efficiency while variables with a positive relationship with ER contribute to low efficiency levels. This implies that at policy level large sized SACCOs should be encouraged as opposed to small sized SACCOs.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the study, key findings, conclusion, recommendations, limitation of the study and suggestions for further research. Section 5.2 presents the summary of the study including key Findings, section 5.3 presents the conclusion, recommendations from the study are presented in section 5.4, section 5.5 presents the limitations of the study and section 5.6 presents suggestions for future research.

5.2 Summary

The objective of the research was to establish the relationship between size and cost efficiency of SACCOs with front office Activity in Kenya and therefore sought to answer the question, what is the relationship between size and cost efficiency of SACCOs with FOSA in Kenya? The research used descriptive and correlation research design. Multiple regression analysis of the efficiency ratio based on annual secondary data, from published financial statements filed with the CCD and SASRA was used. The population consisted of 124 SACCO societies licensed by SASRA as at 31st December 2012.

A random sample of 45 SACCO societies was selected and financial statements from 43 SACCO societies were obtained, only two SACCOs did not have financial statements for the full period of 5 years but had filled returns for 4 years therefore a total of 213 observations were made. This constitutes a response rate of 95%. SACCO specific variables which included the natural log of total assets, Capital adequacy ratio, staff costs representing management

quality, return on assets, and liquidity were the independent variables while the efficiency ratio (ER) was the dependent variable.

The research found that the efficiency ratio has a strong negative correlation with total assets at -0.308, a weak negative relationship between efficiency ratio and capital adequacy of -0.007 was observed and a strong negative relationship between efficiency ratio and return on assets of -0.643 was observed. From literature reviewed the lower the efficiency ratio the higher the level of efficiency, thus for all the variables with a negative relationship with the efficiency ratio, have conversely a strong positive relationship with the level of efficiency and thus contribute to high efficiency levels.

The research established that there is a positive relationship between Efficiency ratio and Management quality of 0.087 and that there is a weak positive relationship between the efficiency ratio and liquidity of 0.012. This means that for variables that are positively correlated with efficiency ratio lead to a higher efficiency ratio, the higher the efficiency ratio the higher the level of inefficiency. There is therefore a negative relationship between these variables and the level of efficiency.

The research further found that the industry efficiency ratio for SACCOs in the country is 0.8095 and that larger SACCOs have a higher mean efficiency level of 0.7106, followed by Small sized SACCOs at 0.8504. The least efficient SACCOs are medium sized at 0.874. The most efficient SACCO over the period was Mombasa Port which had a mean ER of 0.3739 followed by Mwalimu SACCO which had a mean ER of 0.4999. The least efficient SACCO was Orthodox which had a mean ER of 1.4743 followed by Fariji with a mean ER ratio of 1.3384.

5.3 Conclusion

The research concludes that efficiency ratio is jointly influenced by total assets, return on assets, management quality, and liquidity. The research concludes that there is a weak positive correlation between efficiency ratio and both management quality and liquidity. The research further concludes that there is a strong negative correlation between Efficiency ratio and both total assets and return on assets, since the lower the efficiency ratio the more efficient a SACCO is, there is a strong positive relationship between efficiency and both total assets and return on assets. The research therefore met its objective, which was to establish the relationship between Size and Cost Efficiency of SACCOs with Front Office Activity in Kenya.

The findings of the research were consistent with the theoretical review, the researchers expectation and with most of the literature reviewed such as; Rangan et al (1988), Limam (2001), Marsh et al (2003), and Kirkpatrick et al (2002), Lyaga (2006), Kising'u (2007) that large financial institutions are associated with higher efficiency than smaller ones. Like most studies both globally and locally the research findings were in conflict with findings in Mutanu (2002) that low capitalized financial institutions were more efficient than highly capitalized ones.

5.4 Recommendations from the Study

The study recommends to the Government and to SASRA the SACCO regulator that there is need to maintain SACCOs with a national outlook as single entities rather than devolving them into smaller units at county levels. This is because the research found there is a positive correlation between total assets and the efficiency level, large sized SACCOs in terms of total

assets were found to be more efficient than both medium sized and small size SACCOs. In view of the finding that there is a positive correlation between efficiency and Size of a SACCO the research recommends that small inefficient SACCOs be merged to form big SACCOs that can take advantage of bigger size which results into economies of scale.

The two most cost efficient SACCOs were Mombasa port and Mwalimu Sacco both in large size category with an efficiency ratio of 0.3739 and 0.499 respectively. The two least cost efficient SACCOs were Orthodox and Fariji with an efficiency ratio of 1.4743 and 1.3384, both were the small Size category. This means that there is a large room for improvement of cost efficiency for management in most of the SACCOs not only towards the industry average level of 0.8095 but to the level of the most efficient SACCO of with an efficiency ratio of 0.3739.

5.5 Limitation of the Study

A number of limitations from the study can be cited. First the study focused on five independent variables namely; total assets, capital adequacy, management quality as derived from staff costs, return on assets and liquidity. The interpretation of the results with respect to efficiency ratio and conversely cost efficiency should be restricted to the variables used in the study. It was not possible to assess the impact of asset quality on efficiency ratio since most of the SACCOs did not disclose their level of nonperforming loans while most SACCOs were not making provisions for loan loss.

Secondly the study used only one measure of efficiency namely the Efficiency ratio, other accounting ratios such as return on assets, return on capital employed and return on investment

among others can also be used to measure firm efficiency (Ikhide, 2000). There are also other techniques of measuring efficiency such as parametric technique mainly being the Stochastic Frontier Approach (SFA) and The Distribution-Free Approach (DFA) and non-parametric techniques such as data envelopment analysis (DEA) and the free disposable hull (FDH).

Finally the data used was extracted from financial statements employing accounting ratios such as return on assets. A set back in using methods based on accounting ratios is that differences in capital structure, business mix and accounting standards across firms may affect these ratios and render comparability inadequate (Ikhide, 2000). The researcher also noted that there was no uniform classification of accounting items and classification was based on subjective decisions on the part of individual SACCOs. In some cases finance costs were treated as operational costs and loans to members as current assets posing challenges in comparability.

5.6 Suggestions for Further Research

The objective of the study was to establish the relationship between size and cost efficiency of SACCOs with FOSA in Kenya. This research can be improved by testing other variables that have an impact on the efficiency ratio such as asset quality measured by taking Non performing loans net of provisions for loan loss divided by the gross loans of a given Sacco

The study can also be replicated in future since according to SASRA Annual report (2011), SASRA has implemented a uniform chart of accounts for all SACCOs with FOSA in Kenya from 2011. A uniform chart of accounts will improve the study by enhancing comparability of data extracted from published financial statements of SACCOs. Finally, the regression model

technique used in the study could be combined with an array of alternative methods of estimating efficiency. This would testify to the robustness of the results against alternative efficiency estimation methods.

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Appendices

Appendix I: Deposit Taking SACCOs Licensed by SASRA as at 31st December 2012

1	MWALIMU	38	MOMBASA PORT
2	HARAMBEE	39	CHUNA
3	AFYA	40	EGERTON UNIVERSITY
4	STIMA	41	CHAI
5	KENYA POLICE	42	KENYA HIGHLANDS
6	UNITED NATIONS	43	MAISHA BORA
7	UKULIMA	44	KENPIPE
8	KENYA BANKERS	45	YETU
9	IMARISHA	46	WANANDEGE
10	GUSII MWALIMU	47	FORTUNE
11	METROPOLITAN	48	NAKU
12	UNAITAS	49	BUNGOMA TEACHERS
13	MAGEREZA	50	SAFARICOM
14	KATECO	51	SUKARI
15	BANDARI	52	NASSEFU
16	BORESHA SACCO	53	WAKENYA PAMOJA
17	HAZINA	54	MOMBASA TEACHERS
18	NYERI TEACHERS	55	WANANCHI
19	KILIFI TEACHERS	56	WARENG TEACHERS
20	NACICO	57	TAI
21	SOLUTION SACCO	58	TAITA TAVETA TEACHERS
22	SHERIA	59	NATION STAFF
23	MENTOR	60	MWITO
24	COSMOPOLITAN	61	MERU SOUTH FARMERS
25	BINGWA	62	KENYA CANNERS
26	MUHIGIA	63	TEMBO
27	TOWER LIMITED	64	KITE
28	KITUI TEACHERS	65	TRANSNZOIA TEACHERS
29	K. UNITY FINANCE	66	SIMBA CHAI
30	WAUMINI	67	MARAKWET TEACHERS
31	NDEGE CHAI	68	COMOCO
32	JAMII	69	FUNDILIMA
33	MURATA	70	ORIENT SACCO
34	THARAKA NITHI TEACHERS	71	NAROK TEACHERS
35	TAIFA	72	BUTETE
36	WINAS	73	MOSACCO
37	ASILI COOPERATIVE	74	KENVERSITY

75	KEIYO TEACHERS	113	NDOSHA
76	DAIMA	114	ENEA
77	GITHUNGURI DAIRY	115	MUDETE TEAFACORY
78	UNIVERSAL TRADERS	116	SOTICO
79	TARAJI	117	SIRAJI
80	MAGADI	118	JJENGE
81	BIASHARA	119	FARIJI
82	AIRPORTS	120	KIAMBAA DAIRY RURAL
83	BURETI TEA GROWERS	121	LENGO
84	CHEPSOL SACCO	122	ORTHODOX
85	IRIYANYI	123	WANAANGA
86	SOT TEA	124	TIMES U
87	NTIMINYAKIRU		
88	MARSABIT TEACHERS		
89	KINGDOM		
90	NDETIKA RURAL		
91	NYAMIRA TEA FARMERS		
92	NAFAKA		
93	THAMANI		
94	CHEMELIL		
95	SKYLINE		
96	MAUA METHODIST		
97	VISION POINT		
98	COUNTY		
99	DHABITI		
100	DIMKES		
101	KMFRI		
102	BARAKA		
103	NANDI HEKIMA		
104	KURIA TEACHERS		
105	IMENTI		
106	NYAMBENE ARIMI		
107	KONONIN TEA GROWERS		
108	CENTENARY		
109	WAKULIMA COMMERCIAL		
110	SAMBURU TRADERS		
111	WASHA		
112	TENHOS		

Source: SASRA SACCO Supervision Annual Report 2012 (Deposit Taking Saccos)

Appendix 2: Observed values of variables from selected sample of 43 SACCOs from 2008 to 2012

CS No	SACCO	Year	ER-Eff Non Int Exp/Total income	TA Natural Log TA	C Total Equity/Ave Assets	Mgt Staff costs/ Ave Assets	ROA SBT/ Ave Assets	Liq NLA/ Total Deposits	Size
2265	MWALIMU	2008	0.6576	10.08	0.0401	0.0135	0.0114	0.1196	L
2265	MWALIMU	2009	0.5273	10.14	0.0521	0.0122	0.0185	0.0694	L
2265	MWALIMU	2010	0.2922	10.20	0.0873	0.0106	0.0443	0.0426	L
2265	MWALIMU	2011	0.5319	10.26	0.1106	0.0147	0.0254	0.0615	L
2265	MWALIMU	2012	0.4902	10.31	0.1459	0.0153	0.0353	0.0433	L
1981	AFYA	2008	0.9800	9.75	0.0448	0.0283	0.0509	0.1161	L
1981	AFYA	2009	0.9918	9.82	0.0405	0.0258	0.0002	0.1676	L
1981	AFYA	2010	0.9930	9.88	0.0352	0.0227	0.0003	0.1051	L
1981	AFYA	2011	0.9386	9.97	0.0328	0.0222	0.0028	0.1201	L
1981	AFYA	2012	0.9538	10.04	0.0504	0.0301	0.0026	0.1472	L
2207	STIMA	2008	0.6632	9.66	0.0840	0.0114	0.0161	0.1084	L
2207	STIMA	2009	0.5019	9.71	0.0896	0.0119	0.0224	0.0369	L
2207	STIMA	2010	0.6527	9.80	0.1204	0.0137	0.0217	0.0184	L
2207	STIMA	2011	0.6112	9.88	0.1373	0.0146	0.0263	0.0845	L
2207	STIMA	2012	0.6364	9.97	0.1593	0.0183	0.0257	0.0168	L
2092	KENYA POLICE	2008	0.9265	9.64	0.0499	0.0113	0.0076	0.0468	L
2092	KENYA POLICE	2009	0.9190	9.71	0.0477	0.0101	0.0084	- 0.0100	L
2092	KENYA POLICE	2010	0.5658	9.81	0.0640	0.0099	0.0206	0.1011	L
2092	KENYA POLICE	2011	0.4621	9.89	0.0708	0.0105	0.0318	0.1417	L
2092	KENYA POLICE	2012	0.6119	9.96	0.0974	0.0092	0.0399	0.0526	L
2375	UNITED NATIONS	2008	0.8014	9.50	0.0445	0.0086	0.0045	0.0556	L

2375	UNITED NATIONS	2009	0.7941	9.59	0.0464	0.0085	0.0045	0.0452	L
2375	UNITED NATIONS	2010	0.6564	9.67	0.0420	0.0077	0.0126	0.0338	L
2375	UNITED NATIONS	2011	0.7159	9.75	0.0498	0.0085	0.0117	0.0279	L
2375	UNITED NATIONS	2012	0.4806	9.82	0.0645	0.0068	0.0160	- 0.0173	L
2026	UKULIMA	2008	0.9456	9.59	0.1035	0.0198	0.0017	0.1013	L
2026	UKULIMA	2009	0.9201	9.63	0.0956	0.0202	0.0026	0.1021	L
2026	UKULIMA	2010	0.9074	9.66	0.1097	0.0289	0.0055	0.0665	L
2026	UKULIMA	2011	0.8924	9.71	0.1024	0.0276	0.0066	0.0549	L
2026	UKULIMA	2012	0.8933	9.81	0.2109	0.0309	0.0069	0.0373	L
2299	KENYA BANKERS	2008	0.8021	9.57	0.0661	0.0124	0.0070	0.0493	L
2299	KENYA BANKERS	2009	0.7875	9.62	0.0672	0.0121	0.0074	0.1672	L
2299	KENYA BANKERS	2010	0.7691	9.61	0.0674	0.0123	0.0080	0.1284	L
2299	KENYA BANKERS	2011	0.8056	9.63	0.0658	0.0129	0.0072	0.1341	L
2299	KENYA BANKERS	2012	0.9088	9.69	1.7639	0.0151	0.0032	0.1773	L
2349	BANDARI	2008	0.8840	9.19	0.1357	0.0180	0.0054	0.0489	L
2349	BANDARI	2009	0.7488	9.27	0.1773	0.0156	0.0134	0.1721	L
2349	BANDARI	2010	0.6545	9.35	0.1846	0.0188	0.0239	0.0885	L
2349	BANDARI	2011	0.6607	9.43	0.2102	0.0162	0.0262	- 0.0427	L
2349	BANDARI	2012	0.5165	9.51	0.2253	0.0138	0.0293	- 0.0358	L
1991	HAZINA	2008	0.7349	9.13	0.0482	0.0132	0.0073	0.0453	L
1991	HAZINA	2009	0.6829	9.22	0.0506	0.0133	0.0094	0.0300	L
1991	HAZINA	2010	0.7887	9.31	0.0493	0.0113	0.0058	0.0619	L
1991	HAZINA	2011	0.5633	9.40	0.0522	0.0098	0.0135	0.0016	L
1991	HAZINA	2012	0.6254	9.47	0.0708	0.0109	0.0116	0.0201	L
2255	KILIFI TEACHERS	2009	0.6075	9.18	0.0771	0.0230	0.0075	0.1663	L
2255	KILIFI TEACHERS	2010	0.9091	9.31	0.0866	0.0268	0.0080	0.2077	L
2255	KILIFI	2011	0.8491		0.0944	0.0197	0.0197	0.1550	L

	TEACHERS			9.34					
2255	KILIFI TEACHERS	2012	0.6724	9.38	0.1315	0.0203	0.0300	0.1282	L
2406	NACICO	2008	0.5790	9.19	0.2674	0.0250	0.0192	0.2963	L
2406	NACICO	2009	0.6075	9.21	0.2658	0.0328	0.0217	0.4390	L
2406	NACICO	2010	0.4618	9.23	0.2693	0.2206	0.0364	0.3950	L
2406	NACICO	2011	0.6619	9.37	0.2444	0.2848	0.0169	0.3477	L
2406	NACICO	2012	0.8113	9.37	0.2578	0.0182	0.0122	0.3111	L
2275	K. UNITY FINANCE	2008	0.5899	9.15	0.0884	0.0128	0.0236	0.2680	L
2275	K. UNITY FINANCE	2009	0.5781	9.18	0.0806	0.0132	0.0253	0.2931	L
2275	K. UNITY FINANCE	2010	0.6450	9.22	0.1881	0.0175	0.0182	0.1597	L
2275	K. UNITY FINANCE	2011	0.8028	9.24	0.1900	0.0319	0.0282	0.1784	L
2275	K. UNITY FINANCE	2012	0.7584	9.27	0.2107	0.0303	0.0381	0.3438	L
6826	THARAKA NITHI TEACHERS	2008	0.8914	9.03	0.0396	0.0207	0.0043	0.2263	L
6826	THARAKA NITHI TEACHERS	2009	0.9731	9.06	0.0427	0.0228	0.0012	- 0.1945	L
6826	THARAKA NITHI TEACHERS	2010	0.9884	9.09	0.0526	0.0257	0.0006	- 0.2001	L
6826	THARAKA NITHI TEACHERS	2011	0.8456	9.14	0.0863	0.0248	0.0094	0.0393	L
6826	THARAKA NITHI TEACHERS	2012	0.8054	9.18	0.0869	0.0268	0.0140	0.0566	L
2077	ASILI COOPERATIVE	2008	0.9561	8.34	0.3843	0.0556	0.0058	0.1116	L
2077	ASILI COOPERATIVE	2009	0.8460	8.94	0.2742	0.0267	0.0105	0.2644	L
2077	ASILI COOPERATIVE	2010	0.3217	9.00	0.1855	0.0219	0.0196	0.0877	L
2077	ASILI COOPERATIVE	2011	0.8041	9.09	0.1743	0.0235	0.0039	0.1252	L
2077	ASILI COOPERATIVE	2012	0.9023	9.16	0.1191	0.0220	0.0060	0.2163	L
1726	MOMBASA PORT	2008	0.2705	8.49	0.0923	0.0219	0.0144	- 0.1291	L
1726	MOMBASA PORT	2009	0.6952	8.73	0.2078	0.0197	0.0116	0.0897	L
1726	MOMBASA PORT	2010	0.3217	8.90	0.1765	0.0126	0.0584	0.1475	L

1726	MOMBASA PORT	2011	0.2491	9.09	0.1875	0.0155	0.0811	- 0.0910	L
1726	MOMBASA PORT	2012	0.3331	9.15	0.2268	0.0163	0.0666	0.0190	L
6433	WAKENYA PAMOJA	2008	0.6667	8.84	0.2077	0.0139	0.0173	0.5846	M
6433	WAKENYA PAMOJA	2009	0.6366	8.91	0.1769	0.0121	0.0144	0.4043	M
6433	WAKENYA PAMOJA	2010	0.9046	8.97	- 0.0080	0.0804	0.0200	1.2620	M
6433	WAKENYA PAMOJA	2011	0.9403	8.94	0.0826	0.1027	0.0134	0.1245	M
6433	WAKENYA PAMOJA	2012	0.9507	8.98	0.1214	0.1021	0.0128	0.3178	M
2484	MOMBASA TEACHERS	2008	0.8636	8.49	0.0846	0.0130	0.0098	0.0251	M
2484	MOMBASA TEACHERS	2009	0.9356	8.54	0.1317	0.0160	0.0072	0.1320	M
2484	MOMBASA TEACHERS	2010	0.7516	8.63	0.1332	0.0167	0.0228	0.1244	M
2484	MOMBASA TEACHERS	2011	0.6527	8.63	0.1734	0.0214	0.0339	0.0583	M
2484	MOMBASA TEACHERS	2012	0.8108	8.66	0.1631	0.0214	0.0190	0.0814	M
2624	WARENG TEACHERS	2008	0.9085	8.81	0.1103	0.0161	0.0040	0.1821	M
2624	WARENG TEACHERS	2009	0.9095	8.80	0.1057	0.0195	0.0040	0.0864	M
2624	WARENG TEACHERS	2010	0.9204	8.82	0.1062	0.0224	0.0040	0.0796	M
2624	WARENG TEACHERS	2011	0.9146	8.88	0.1091	0.0226	0.0048	0.1132	M
2624	WARENG TEACHERS	2012	0.8247	8.92	0.1241	0.0208	0.0100	0.0513	M
3047	MWITO	2008	0.9811	8.58	0.0368	0.0210	0.0018	0.0056	M
3047	MWITO	2009	1.0187	8.65	0.0372	0.0201	0.0051	- 0.0060	M
3047	MWITO	2010	0.7670	8.72	0.0524	0.0182	0.0151	0.0126	M
3047	MWITO	2011	0.8859	8.79	0.0668	0.0215	0.0060	0.0098	M
3047	MWITO	2012	0.8422	8.86	0.0628	0.0226	0.0084	- 0.0246	M
2757	KITE	2008	1.4581	8.72	0.0066	0.0104	-0.0143	0.1959	M
2757	KITE	2009	0.8895	8.74	0.0113	0.0114	0.0042	0.1466	M
2757	KITE	2010	0.7406	8.78	0.0452	0.0119	0.0135	0.2085	M
2757	KITE	2011	0.7305	8.79	0.0556	0.0136	0.0130	0.1450	M
2757	KITE	2012	0.8146	8.81	0.0594	0.0148	0.0122	0.1265	M

2686	COMOCO	2008	0.7530	8.58	0.1007	0.0245	0.0233	0.0455	M
2686	COMOCO	2009	0.9194	8.66	0.0506	0.0310	0.0067	0.1113	M
2686	COMOCO	2010	0.9468	8.72	0.0422	0.0172	0.0044	- 0.3421	M
2686	COMOCO	2011	0.9327	8.72	0.0456	0.0184	0.0070	- 0.1767	M
2686	COMOCO	2012	0.9512	8.72	0.0535	0.0221	0.0054	- 0.1530	M
10020	GITHUNGURI DAIRY	2008	0.5188	8.15	0.0583	0.0125	0.0266	0.2880	M
10020	GITHUNGURI DAIRY	2009	0.6085	8.35	0.1102	0.0399	0.0804	0.1649	M
10020	GITHUNGURI DAIRY	2010	0.8811	8.44	0.0890	0.0413	0.0250	0.4531	M
10020	GITHUNGURI DAIRY	2011	0.9005	8.55	0.0800	0.0316	0.0150	0.2213	M
10020	GITHUNGURI DAIRY	2012	0.8913	8.62	0.1217	0.0292	0.0162	0.1755	M
6403	UNIVERSAL TRADERS	2008	0.3694	8.28	0.0760	0.0292	0.0030	- 0.0479	M
6403	UNIVERSAL TRADERS	2010	0.9126	8.40	0.2048	0.0577	0.0140	0.5359	M
6403	UNIVERSAL TRADERS	2011	0.8482	8.58	0.2206	0.0557	0.0277	0.3868	M
6403	UNIVERSAL TRADERS	2012	0.8684	8.59	0.2182	0.0539	0.0225	0.3442	M
2664	MAGADI	2008	0.7221	8.44	0.0106	0.0076	0.0021	0.2134	M
2664	MAGADI	2009	0.8503	8.45	0.0187	0.0156	0.0028	0.3063	M
2664	MAGADI	2010	0.7462	8.51	0.0330	0.0209	0.0116	0.2721	M
2664	MAGADI	2011	0.8402	8.52	0.0453	0.0217	0.0062	0.1272	M
2664	MAGADI	2012	0.7348	8.56	0.0594	0.3946	0.0118	0.2721	M
6432	BIASHARA	2008	1.1282	7.97	0.1137	0.0259	0.0234	0.0705	M
6432	BIASHARA	2009	1.0684	8.12	0.1152	0.0374	0.0381	0.0989	M
6432	BIASHARA	2010	0.8852	8.30	0.1621	0.0299	0.0594	0.1527	M
6432	BIASHARA	2011	0.8349	8.43	0.2405	0.0546	0.0642	0.0736	M
6432	BIASHARA	2012	0.8131	8.55	0.1857	0.0531	0.0725	0.1643	M
2843	IRIYANYI	2008	0.9050	8.12	0.1471	0.0777	0.0156	- 0.0620	M
2843	IRIYANYI	2009	0.8286	8.16	0.1592	0.0772	0.0290	0.1352	M
2843	IRIYANYI	2010	0.9309	8.21	0.3888	0.1008	0.0161	0.8186	M

2843	IRIYANYI	2011	0.9908	8.41	0.2832	0.1114	0.0022	0.9697	M
2843	IRIYANYI	2012	0.9760	8.49	0.3446	0.0870	0.0052	1.1247	M
9208	KINGDOM	2008	0.8925	7.96	0.1478	0.0207	0.0079	0.0151	M
9208	KINGDOM	2009	0.9210	8.07	0.1523	0.0240	0.0075	0.1097	M
9208	KINGDOM	2010	0.9508	8.18	0.1139	0.0271	0.0043	0.2035	M
9208	KINGDOM	2011	0.8253	8.29	0.1148	0.0265	0.0153	0.2296	M
9208	KINGDOM	2012	0.8404	8.47	0.0989	0.0354	0.0112	0.2826	M
7593	NYAMIRA TEA FARMERS	2008	0.9212	8.12	0.2065	0.0787	0.0110	0.2013	M
7593	NYAMIRA TEA FARMERS	2009	0.8709	8.12	0.2040	0.0576	0.0166	0.2560	M
7593	NYAMIRA TEA FARMERS	2010	0.9671	8.28	0.1936	0.0719	0.0234	0.4035	M
7593	NYAMIRA TEA FARMERS	2011	0.9134	8.28	0.2469	0.0743	0.0192	0.3394	M
7593	NYAMIRA TEA FARMERS	2012	1.1075	8.45	0.2401	0.0615	-0.0150	0.3864	M
7320	MAUA METHODIST	2008	1.2904	8.37	0.2751	0.0399	-0.0283	-0.0040	M
7320	MAUA METHODIST	2009	1.2890	8.36	0.2441	0.0440	-0.0328	-0.0168	M
7320	MAUA METHODIST	2010	0.7631	8.34	0.2890	0.0417	0.0318	0.0937	M
7320	MAUA METHODIST	2011	0.6794	8.36	0.2994	0.0324	0.0506	0.1856	M
7320	MAUA METHODIST	2012	0.8012	8.41	0.3010	0.0341	0.0419	0.0806	M
7221	KURIA TEACHERS	2008	0.7790	8.01	0.0934	0.0274	0.0286	0.0974	S
7221	KURIA TEACHERS	2009	0.8038	8.07	0.0898	0.0162	0.0117	0.1630	S
7221	KURIA TEACHERS	2010	0.7941	8.11	0.0709	0.0118	0.0096	-0.1148	S
7221	KURIA TEACHERS	2011	0.9407	8.18	0.0802	0.0334	0.0055	0.4391	S
7221	KURIA TEACHERS	2012	0.8788	8.23	0.0709	0.0294	0.0109	0.3156	S
2033	IMENTI	2008	0.5962	7.94	0.1061	0.0418	0.0520	0.1253	S
2033	IMENTI	2009	0.4681	8.01	0.0840	0.0380	0.0530	0.1229	S
2033	IMENTI	2010	0.5220	8.14	0.2881	0.0318	0.0512	0.1718	S
2033	IMENTI	2011	0.7438	8.15	0.1910	0.0120	0.0184	0.1999	S
2033	IMENTI	2012	0.6846	8.21	0.2152	0.0164	0.0257	0.0980	S

6917	NYAMBENE ARIMI	2008	0.9687	8.14	0.2956	0.0649	0.0045	0.3734	S
6917	NYAMBENE ARIMI	2009	0.8188	8.15	0.2907	0.0730	0.0333	0.3119	S
6917	NYAMBENE ARIMI	2010	0.8991	8.15	0.3060	0.0684	0.0189	0.1097	S
6917	NYAMBENE ARIMI	2011	0.7986	8.14	0.2286	0.0719	0.0482	0.1670	S
6917	NYAMBENE ARIMI	2012	0.7984	8.19	0.2665	0.0810	0.0526	0.4250	S
6569	KONON TEA GROWERS	2008	0.9878	8.06	0.0762	0.0136	0.0353	- 0.2501	S
6569	KONON TEA GROWERS	2009	0.4881	8.12	0.0678	0.0079	0.0490	- 0.5175	S
6569	KONON TEA GROWERS	2010	0.5791	8.24	0.1953	0.0277	0.0677	0.3898	S
6569	KONON TEA GROWERS	2011	0.6669	8.25	0.1780	0.0284	0.0596	0.2526	S
6569	KONON TEA GROWERS	2012	0.5379	8.19	0.2723	0.0431	0.0965	0.2407	S
10226	WAKULIMA COMMERCIAL	2008	0.6604	7.84	0.2308	0.0343	0.0455	0.8790	S
10226	WAKULIMA COMMERCIAL	2009	0.7132	7.94	0.3388	0.0366	0.0381	0.8871	S
10226	WAKULIMA COMMERCIAL	2010	0.5083	8.04	0.3732	0.0335	0.0585	0.1991	S
10226	WAKULIMA COMMERCIAL	2011	0.5528	8.10	0.2058	0.0354	0.0294	0.0322	S
10226	WAKULIMA COMMERCIAL	2012	0.5249	8.17	0.2342	0.0443	0.0385	0.0174	S
3350	WASHA	2008	0.6438	7.92	0.1110	0.0086	0.0167	0.0520	S
3350	WASHA	2009	0.8168	7.89	0.1307	0.0126	0.0095	0.0204	S
3350	WASHA	2010	0.6411	8.07	0.1396	0.0110	0.0244	0.1106	S
3350	WASHA	2011	0.9442	8.11	0.1270	0.0110	0.0034	0.1461	S
3350	WASHA	2012	0.8961	8.14	0.1326	0.0143	0.0064	0.1090	S
5676	TENHOS	2008	0.6917	8.00	0.0462	0.0048	0.0229	0.0710	S
5676	TENHOS	2009	0.6987	8.05	0.0505	0.0050	0.0188	0.3434	S
5676	TENHOS	2010	0.6681	8.07	0.1959	0.0300	0.0178	0.0289	S
5676	TENHOS	2011	0.7929	8.09	0.2241	0.0405	0.0295	- 0.0343	S
5676	TENHOS	2012	0.8830	8.12	0.2412	0.0484	0.0193	0.0848	S
2196	NDOSHA	2008	0.5523	7.87	0.7100	0.0124	0.0817	0.2745	S
2196	NDOSHA	2009	0.4985	7.93	0.7727	0.0141	0.1076	0.4360	S

2196	NDOSHA	2010	0.6194	7.98	0.8056	0.0333	0.0558	1.3293	S
2196	NDOSHA	2011	0.5375	8.06	0.2955	0.0351	0.0590	0.0638	S
2196	NDOSHA	2012	0.7478	8.07	0.3027	0.0326	0.0278	0.1126	S
2233	SOTICO	2008	0.9736	7.87	0.1117	0.0116	0.0028	0.2227	S
2233	SOTICO	2009	0.9855	7.89	0.1167	0.0168	0.0016	0.1476	S
2233	SOTICO	2010	0.9984	7.94	0.1123	0.0152	0.0001	0.1359	S
2233	SOTICO	2011	0.6973	7.97	0.1214	0.0190	0.0248	0.0976	S
2233	SOTICO	2012	0.6025	8.01	0.1473	0.0237	0.0403	0.1585	S
7979	SIRAJI	2008	0.5726	7.78	0.1516	0.0180	0.0483	0.1255	S
7979	SIRAJI	2009	0.5144	7.82	0.2119	0.0176	0.0659	0.1754	S
7979	SIRAJI	2010	1.5393	7.87	0.2250	0.0234	0.0372	0.0416	S
7979	SIRAJI	2011	0.9312	7.92	0.1277	0.0297	0.0068	0.0555	S
7979	SIRAJI	2012	0.9875	7.98	0.1460	0.0344	0.0015	0.0718	S
5937	JIJENGE	2008	0.8278	7.79	0.0730	0.0072	0.0511	0.0244	S
5937	JIJENGE	2009	0.4601	7.84	0.0633	0.0077	0.0708	0.1095	S
5937	JIJENGE	2010	0.7892	7.92	0.1356	0.0148	0.0817	0.1327	S
5937	JIJENGE	2011	0.9233	7.97	0.1191	0.0153	0.0013	0.2861	S
5937	JIJENGE	2012	1.1076	7.96	0.0992	0.0174	-0.0192	0.1715	S
9231	FARIJI	2008	1.0460	7.82	0.1695	0.0821	-0.0075	0.4208	S
9231	FARIJI	2009	1.0397	7.94	0.1653	0.0886	-0.0067	0.4152	S
9231	FARIJI	2010	0.9825	7.99	0.1441	0.0899	0.0036	0.3471	S
9231	FARIJI	2011	1.5767	8.07	0.1150	0.0734	-0.0627	0.3902	S
9231	FARIJI	2012	2.0472	7.98	0.0300	0.0894	0.0877	0.2366	S
2467	LENGO	2008	0.3110	7.45	0.1975	0.0188	0.1010	0.2371	S
2467	LENGO	2009	0.3589	7.59	0.2879	0.0172	0.1457	0.4894	S
2467	LENGO	2010	0.6493	7.82	0.1937	0.0370	0.0065	0.8660	S
2467	LENGO	2011	1.3602	7.86	0.1456	0.0504	0.0108	0.4216	S

2467	LENGO	2012	1.5258	7.82	0.1879	0.0799	0.0021	0.4822	S
10120	ORTHODOX	2008	1.1066	7.46	0.1381	0.0468	0.0130	0.0896	S
10120	ORTHODOX	2009	0.9622	7.62	0.0717	0.0400	0.0046	0.1284	S
10120	ORTHODOX	2010	2.2393	7.70	0.0260	0.0545	-0.1117	-0.0444	S
10120	ORTHODOX	2011	2.2267	7.76	0.0464	0.0524	-0.1237	0.0903	S
10120	ORTHODOX	2012	0.8367	7.80	0.1342	0.0674	0.0399	0.0491	S
L is large size,M is medium Size & S is Small size SACCO									

Source: Research Data

Appendix 3: ER ranking based on mean values of observed variables for 2008 to 2012

CS No	SACCO	Rank	ER-Ratio		Size
			Non Exp/Total income	Interest	
1726	MOMBASA PORT	1	0.3739		L
2265	MWALIMU	2	0.4999		L
2196	NDOSHA	3	0.5911		S
10226	WAKULIMA COMMERCIAL	4	0.5919		S
2033	IMENTI	5	0.6029		S
2207	STIMA	6	0.6131		L
2406	NACICO	7	0.6243		L
6569	KONONIN TEA GROWERS	8	0.6520		S
2275	K. UNITY FINANCE	9	0.6748		L
1991	HAZINA	10	0.6791		L
2375	UNITED NATIONS	11	0.6897		L
2349	BANDARI	12	0.6929		L
2092	KENYA POLICE	13	0.6971		L
5676	TENHOS	14	0.7469		S
6403	UNIVERSAL TRADERS	15	0.7497		M
2255	KILIFI TEACHERS	16	0.7595		L
10020	GITHUNGURI DAIRY	17	0.7601		M
2077	ASILI COOPERATIVE	18	0.7660		L
2664	MAGADI	19	0.7787		M
3350	WASHA	20	0.7884		S
2484	MOMBASA TEACHERS	21	0.8029		M
2299	KENYA BANKERS	22	0.8146		L
6433	WAKENYA PAMOJA	23	0.8198		M
5937	JIJENGE	24	0.8216		S
7221	KURIA TEACHERS	25	0.8393		S
2467	LENGO	26	0.8410		S
2233	SOTICO	27	0.8514		S
6917	NYAMBENE ARIMI	28	0.8567		S
9208	KINGDOM	29	0.8860		M
2624	WARENG TEACHERS	30	0.8956		M
3047	MWITO	31	0.8990		M
2686	COMOCO	32	0.9006		M
6826	THARAKA NITHI TEACHERS	33	0.9008		L
7979	SIRAJI	34	0.9090		S
2026	UKULIMA	35	0.9118		L
2843	IRIYANYI	36	0.9263		M
2757	KITE	37	0.9267		M
6432	BIASHARA	38	0.9460		M
7593	NYAMIRA TEA FARMERS	39	0.9560		M
7320	MAUA METHODIST	40	0.9646		M
1981	AFYA	41	0.9714		L

9231	FARIJI	42	1.3384	S
10120	ORTHODOX	43	1.4743	S
	L is large size, M is medium Size & S is Small size SACCO			

Source: Research Data