

Financial Performance Analysis of Kenya's SACCO Sector Using the Altman Z Score Model of Corporate Bankruptcy

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Abstract

The cooperative sector plays a crucial role in country's socio-economic development significantly contributing to Nation's Gross Domestic Product. Management face the challenge to increase returns and such comes with increases in risks. Insolvency is a major risk to SACCO's hence a source of finance instability. Kenya's enhanced regulatory requirement has emphasized on capital adequacy requirements for SACCOs and developed financial reporting standard (CAMELS). World Council of Credit Unions has a set of financial ratios, the "PEARLS". Z score model combine several ratio measures into a meaningful predictive model. This study analyses Sacco financial statement to determine financial performance, predictor variable potency and models contribution to finance stability. The Z scores "cut-off" values are greater than 2.99 for "non-bankrupt", below 1.81 for bankrupt and area between 1.81 and 2.99 for "grey area". The study population is 215 Deposit taking SACCOs with a sample of thirty identified randomly. Quantitative research design is used to analyze longitudinal data for the period 2008 – 2013. The study found variables X_1 and X_4 potent and other variables equally contributing to the scoring. Financial analysis shows a fairly strong finance position and need to improve performance for SACCOs in grey and bankrupt area moving them to non bankrupt position. Twenty four SACCO's have a positive slope, a trajectory if sustained enhance sector financial stability with only six SACCOs having a negative slope. The study concludes regulatory agency is correct in advocating for additional capital base as such will improve individual Z Scores and recommends model application in finance analysis.

Keywords: Bankruptcy, Potency , Financial stability, SACCO Financial performamce. Z-Score model, Discriminant Analysis

1.1 Background Information

Cooperative societies as formal organizations enable their membership make efforts to achieve any common objectives on voluntary and democratic basis. According to (John, 2002), the first ever Co-operative movement was started by Robert Owen in the year 1844 and in recent years the SACCO sector has faced tough challenges globally as noted by (WOCCU, 2012) to include mission drifts, income generation, compliance, competition, insufficient capital among many others. The sectors financial stability will impact broadly on the nation's economic growth and employment creation.

SACCOs are required to file audited financial statements every fiscal year and although SACCOs comply with this requirement, financial statements have shortcomings including non availability on regular basis. To promote financial transparency SACCOs should provide timely financial updates and external auditors are evaluated every three to five years using competitive bidding process. Going concern is general accounting assumption and according to (Wood & Sangster, 2005) economic entities are assumed to continue operating in the foreseeable future. It's on this basis that financial statements are prepared and auditors express opinion.

The total assets in the Kenya's SACCO sector increased to K.sh.248 billion from K.sh. 216 billion in 2010. Currently, the sector is the largest in Africa and accounts for 60, 64, and 63 per cent of the continent's savings, loan and assets respectively according to (SASRA, 2011). The use of financial products in SACCO saving increased from 9.2 to 10.6 in 2009 and 2013 while ratios for obtaining SACCO credit were 3.1 and 4.0 respectively, an indication of increased activity according to (CBK & FSDKenya, 2013). SACCOs need to safeguard gains made so far and build confidence since bankruptcy of a SACCO will be a manifestation of instability in the sector.

Crisis such as the global financial markets faced since 2007 have grave implications for economic growth in developed and developing countries. Kenya's economy and financial system stability still face vulnerabilities associated with global risks. The global economic growth declined to 3.9 percent in 2011 according to the Financial Stability Report by (Central Bank of Kenya, 2011). Continued fragility in Europe, declining demands in Asia and slow recovery in US pose significant threats to Kenya's macroeconomic and financial stability. Emerging markets face the risk of sharp reversals prompted by weaker global growth and rise in funding costs that could weaken domestic banks and finance sector. (Lim, 2014) notes that worst isn't over for emerging markets as benchmark stock index has sank low, nations' currencies are tumbling and China's economy slows.

The state of a country's economy affects SACCO memberships and loan intake as well. According to (Mpiira, et al., 2013) people will not join SACCO where there is no viable economic enterprise that would generate them income. Research from IMF by (Hesse & Cihák, 2007) however indicate that cooperative financial institutions tend to be more stable in times of crisis, as their investment patterns use the capital of members in ways that best serve their long term needs and interests. It is therefore thought that their comparative stability, under both average and extraordinary conditions, can help to mitigate crisis impact for members and clientele, especially in the short-term. However, since most SACCOs draw their membership from the formal sector, in times of economic downturn, the functioning of the SACCO can be undermined if member's incomes are destabilized by volatility in the economy and this may lead to reduction of members' savings and increased demand for loans. Legislations and regulations have been enacted to protect shareholders, build confidence, ensure market failures are corrected, redress information asymmetry and ensure transparency. SACCO sector stability impacts long-term economic growth through effect on the efficiency of intermediation and allow monitoring of the users of external funds, thus affecting the productivity of capital employed. This impacts the volume of saving, which influences the future income-generating capacity of the economy and also affects the stability of the whole economy.

Regular financial review of SACCO's according to (SASRA, 2011) is paramount and crucial as they are integral part of Kenya's finance system that includes the banking sector, Insurance industry and Retirement Benefit Institutions. Basel principle 13 (Supervision, 2000) provides for disclosure of information about the bank to manage public perception of the organisation and its soundness. SASRA in 2012 adopted the CAMELS performance rating framework to assess the financial soundness of Sacco's focusing on prudential standards. The adoption and implementation of CAMELS performance evaluation tool ensure objectivity and standardization in monitoring of the financial soundness and stability of individual Sacco's. The effectiveness of this system is yet to be ascertained and challenges have been noted with the system. World Council of Cooperative Unions developed the PEARLS monitoring system. This is a toolkit, a series of ratios consolidated into an evaluation program that is capable of measuring the individual components and the system as a whole. A study by J. Chavez on PEARL rating found that the financial performance of the SACCO sector is extremely weak and translating to weakness in other areas, especially governance, fiscal discipline, financial, operational, internal controls, and the risk management involved in running a financial institution.

With these challenges, financial analysis in the sector is crucial to safeguard member investment. The researcher in this study conducts financial analysis using financial data from sampled Sacco's. The analysis is done to determine sectors financial state using the Z Score bankruptcy prediction model. The challenges facing the sector makes collapse of a SACCO especially large SACCO detrimental, this could have contagion effect on the entire financial sector and the Kenyan economy due to the large market share SACCO's have in Kenya. The Z score parameter values used in this study select cut off point, an optimum Z value, which enables predictions. All SACCO's having a Z score of greater than 2.99 fall into the "non-bankrupt" sector, while those firms having a Z below 1.81 are all bankrupt. The area between 1.81 and 2.99 will be defined as the "zone of ignorance". The research finding will be useful to regulators for policy initiating interventions to mitigate negative consequences.

1.2 Statement of the Problem

SACCO management challenges include increasing returns to shareholders and such come at a cost of increases in risks. Insolvency defined by (Saunders & Cornett, 2009) as risk that a Finance Institution may not have enough capital to offset a sudden decline in the value of its assets relative to its liabilities, is an ever present reality in SACCO sector. The enhanced regulatory framework in the sector is not the panacea for inadequacies in the sector. In September 2012 SASRA issued a communication to SACCO's to comply with capital adequacy requirements as set out in (SACCO SOCIETIES ACT, 2008). SASRA developed a web-based electronic submission of financial returns (CAMELS) for objective analysis of the financial returns submitted by the licensed SACCO's.

The electronic system is a means to achievement of prudent financial management; promoting sound financial and business practices in the SACCO sector. This performance rating framework however has had a fair share challenges. Many different financial ratios and rules of the thumb have been promoted for financial institutions worldwide and few consolidated into an evaluation program. The World Council of Credit Unions, Inc. has a set of financial ratios "PEARLS" developed by (David, 2002) to measure key areas of Sacco's operations: Protection, Effective financial structure, Asset quality, Rates of return and cost, Liquidity and Signs of growth. A study by (Chavez, 2006) based PEARL rating found that the financial performance of the SACCO sector is extremely weak and translating to weakness in other areas, especially governance, fiscal discipline, financial, operational, internal controls, and the risk management involved in running a financial institution.

Financial ratio methodologies are essentially univariate in nature with emphasis is placed on individual signals of impending problems. Ratio analysis is susceptible to faulty interpretation potentially confusing, for instance, a firm with a poor profitability and/or solvency record may be regarded as a potential bankrupt. However, because of its above average liquidity, the situation may not be considered serious hence the potential ambiguity as to the relative performance of several firms is clearly evident. These shortcomings led to development of a combination of several ratio measures into a meaningful predictive model. Z score model use predictor measures of profitability, liquidity, and solvency which are most significant indicator used to derive the Multiple Discriminant function, the Z score. The researcher in this study performs financial analysis to determine sector performance, variable potency and financial stability using the Z score Model developed by (Altman I. E., 1968) on Kenyan SACCO's.

1.3 Objectives of the Study

1.3.1 General Objective

The general objective of the study is determining financial sector performance using the Altman's Z score model of corporate bankruptcy prediction. The main focus is on Kenya's SACCO sector through analysing finance statements, applying the model to analyse Sacco's financial performance.

1.3.2 Specific Objectives

- i) To determine potency of predictor variables in Altman Z Score model of bankruptcy prediction.
- ii) To evaluate the financial performance of various SACCO's in Kenya.
- iii) Determine Altman Z score contribution to financial stability of the SACCO sector.

1.4 Research Questions

- i) What is the contribution of specific predictor variables in Models potency?
- ii) What is the level of SACCO financial performance using Altman Z Score model?.
- iii) What is the Altman Z Score contribution to financial stability?

1.5 Significance of the Study

Altman Z Score provides a quantitative measure of a SACCO's financial health. It is a consolidation of factors contributing to SACCO's financial health and uncovers emerging trends, an indication of either improvement or deteriorating financial condition. It will help detect anticipated weaknesses early and plan to mitigate anticipated consequences. The research findings are useful in formulating requisite policies to build confidence in the sector.

SACCO members need to know the status of their investments in SACCO's. Investors are anxious about their investments, according to (Statman M. , 2005) whereas rational investors prefer more money to less, normal investors are subject to cognitive biases and reluctant to realize losses because realizing losses bring them pain of regret.

The researcher tests potency of the Z Score model variables and offer a tool to SACCO's sector for financial analysis. Study finding will aid lenders and investors in selecting attractive risk situations and in determining appropriate risk premiums

This study will also be useful to academicians and will stimulate further interest to both researchers and students interested in this field to carry further studies. SACCO Members will also appreciate developments in SACCO sector financial evaluations.

1.6 Scope of the Study

This study covers the SACCO sector in Kenya with random sample of thirty Deposit Taking Sacco's selected. The researcher is confident that valuable insights and conclusions drawn from this study are useful in making financial, regulatory and policy decisions pertaining the sector.

Literature Review

2.1 Theoretical Literature

World Council of Credit unions focused its mission in 2012 to build a global community of credit union and financial cooperatives and equipping the credit union cause representing and defending credit unions at international standard setting bodies on issues related to Basel III capital requirements (WOCCU, 2012). Benchmarking Kenya's SACCOs performance with International SACCOs is necessary according to (IFAD, 2012). The (WOCCU, 2102), shows Kenya with 5,000 SACCO's having a penetration rate of 19.53%. and prominently leading in key statistics on the sector.

2.1.1 Ratio Analysis

Financial ratio analysis has been a useful way of gaining a "snapshot" picture of SACCOs. Ratios have no financial theory behind them to tell us what should be the case (or value) thus no way to identify a "theoretically best" value for any of the ratios. SASRA's web-based electronic submission of returns (CAMELS) is ratio based and is used for objective analysis of the financial returns submitted by the licensed Sacco's. CAMELS' performance rating framework is used to assess the financial soundness of the SACCO's focusing on capital adequacy, asset quality, operational sustainability, liquidity and sound management practices that ensure member deposits are safe. The compliance in terms of submitting accurate returns and on time averaged 80% in 2011 according to SASRA, but challenges still remain on the accuracy of returns due to inadequate technical skills and accounting controls in a number of Sacco societies.

The World Council of Cooperative Unions developed the PEARLS monitoring system. According to (David, 2002), many different financial ratios and rules of the thumb have been promoted for financial institutions worldwide; few have been consolidated into an evaluation program that is capable of measuring both individual components and the system as a whole. The World Council of Credit Unions, Inc. set of financial ratios "PEARLS" measures key areas of SACCOs operations: Protection, Effective financial structure, Asset quality, Rates of return and cost, Liquidity and Signs of growth. The use of the PEARLS evaluation system is as an Executive Management Tool and monitoring the performance of the credit union remain the most important. The PEARLS system is designed as a management tool that goes beyond the simple identification of problems and help managers find meaningful solutions to serious institutional deficiencies.

2.1.2 Multiple Discriminant Analysis and Altman Z Score

A linear discriminant analysis (LDA) and the related Fisher's linear discriminant are methods used in statistics, pattern recognition and machine learning to find a linear combination of features which characterizes or separates two or more classes of objects or events. The resulting combination may be used as a linear classifier or, more commonly, for dimensionality reduction before later classification. The Altman Z Score is a Multiple Discriminant function developed by (Altman I. E., 1968) using statistical technique and used to classify an observation into one of several *a priori*; groupings dependent upon the observation's individual characteristics. It is used primarily to classify and make predictions in problems where the dependent variable appears in qualitative form, the number of original explicit grouping can be two or more. This study use the Z score model of two classifications for SACCO's that fall bankrupt and non-bankrupt SACCO's in finance analysis.

2.1.3 Bankruptcy Theories

Bankruptcy predictions have been based on accounting ratios and other financial variables.

Linear discriminant analysis was the first statistical method applied to systematically explain which firms entered bankruptcy vs. survived. One of the classic works in the area of ratio analysis and bankruptcy classification was performed by (Beaver, 1967), his univariate analysis of a number of bankruptcy predictors set the stage for the multivariate attempts. Beaver found that a number of indicators could discriminate between matched samples of failed and non failed firms for as long as five years prior to failure. The paper by (Wilcox, 1970) presents a simple, intuitive theory of business risk.

The results are used to explain empirical observations of Beaver on the power of various financial ratios to predict failure of firms, to hypothesize improved predictive ratios for use in selecting attractive risk situations and in determining appropriate risk premiums. There are two venerable models for assessing the distress of industrial corporations according to (Altman I. E., 2000). These are the so-called Z-Score model (1968) and ZETA® 1977 credit risk model. Both models are still being used by practitioners throughout the world. The latter is a proprietary model for subscribers to ZETA Services, Inc. (Hoboken, NJ). Despite limitations including known non-conformance of accounting ratios to the normal distribution assumptions of LDA, Edward Altman's 1968 Z score model is still a leading model in practical applications. According to (Altman I. E., 2000) detection of company operating and financial difficulties is a subject which has been particularly amenable to analysis with financial ratios.

2.1.4 Capital Structure Theories and Equity Valuation

A firm's Capital Structure defined by (Horne, 1989) as the proportion or mix of securities used to finance a firm consist of Debt (borrowed) capital and equity (ownership) capital

$$\text{Capital Structure} = \text{Debt} + \text{Preferred} + \text{Equity}$$

An optimal capital structure is one that maximizes the firm value by minimizing the cost of capital that is the weighted average cost of capital is minimized and value of the firm is maximized. According to Modigliani, as firm's use of debt increases its cost of equity also rise and in an exactly specified manner. However, the cost of equity rises at a slower rate than it did in the absence of taxes. It is this characteristic that produces the increase in firm value as leverage increases, as shown in MM Proposition I. Financial distress in SACCO and bankruptcy costs are direct costs e.g. legal fees, and other costs of re-organization plus indirect costs such as the opportunity cost of funds being tied up during bankruptcy proceedings, lost profits created by decreased sales in anticipation of bankruptcy etc.

SACCO's are not listed at the Nairobi Securities Exchange and hence their securities are not traded at the Nairobi Securities Exchange. A method to value their equity has been adopted in this research for the equity of the SACCO's. The financing mix for SACCOs is either equity, or a combination of equity and debt, there is no preferred stock financing and member savings constitute equity for the SACCO. The financing method of preference depends on a multitude of factors and when these factors change, the financing mix will most likely change. A Change in the financing mix affects the value of the firm and a change in the relationship between debt and equity affects the cost of capital (k_c) of the firm and therefore its total market valuation (V).

The valuation of Sacco's equity in this study has been estimated using the net income method which was introduced by David Durand in 1952. Firm valuations can be complicated as noted by (Damodaran, 2002), it's easy to lose the audience (and one's self) in the details. Under this method, the value of the firm in most general case can be written as the present value of the expected free cash flows to the firm. The earnings available, (O), are capitalized at a constant rate, wkc, which is the overall capitalization rate defined by (Horne, 1989) as discount rate used to determine the value of a stream of expected future cash flows. This is shown in equations below; 1 and 2.

$$\text{Value of the firm} = \text{Market value of equity} + \text{Market value of debt.}$$

$$\begin{aligned} &= \frac{\text{Expected Net Operating income}}{\text{Expected overall capitalisation rate}} \\ &= \frac{O}{wkc} = \frac{O}{B+S} \end{aligned} \tag{1}$$

Re-arranging equation (1) we obtain

$$V = (B + S) = \frac{O}{wkc} \tag{2}$$

2.2 Empirical Review

Independent predictor variables in the study are X_1 , X_2 , X_3 , X_4 and X_5 and study looks at potency of specific variables in overall Z score. Research by (Pam, 2013) predicting of Corporate Bankruptcy in the Banking Sector of Nigeria found Liquidity, profitability, operating efficiency and total assets turnover (which are the key variables in the Altman's Z score) as very potent tools in the determination of the strength of a bank. The study focusing on secondary data obtained from annual financial reports and accounts of two (2) non-failed banks and two (2) failed banks in Nigeria selected on a convenient sampling basis.

The paper (Adler & Weiss, 2001) finds Altman Z score model efficient and concludes it's up to businesses to make their processes efficient. Stakeholders including business managers should be given importance by the company regarding financial information of the business. A study by (Chavez, 2006) on PEARL rating found the financial performance of the SACCO sector extremely weak translating to weakness in other areas, especially governance, fiscal discipline, financial, operational, internal controls, and the risk management involved in running a financial institution.

The discriminant-ratio model have proved to be extremely accurate in predicting bankruptcy correctly in 94 per cent of the initial sample with 95 per cent of all firms in the bankrupt and non-bankrupt groups assigned to their actual group classification. Furthermore, the discriminant function was accurate in several secondary samples introduced to test the reliability of the model according to (Altman I. E., 1968)

Stable financial system is defined by (Schinasi, 2004) as one that enhances economic performance in many dimensions and unstable financial system as one that detracts from economic performance. A financial system is in a range of stability whenever it is capable of facilitating (rather than impeding) the performance of an economy, and of dissipating financial imbalances that arise endogenously or as a result of significant adverse and unanticipated events. According to (Central Bank of Kenya, 2013) the number of individuals using SACCOs as financial service provider decreased since 2006, from 13.5% in 2009 to 9.1% in 2013. This is a deterioration in financial stability since financial stability broadly describes a steady state in which the financial system efficiently performs its key economic functions.

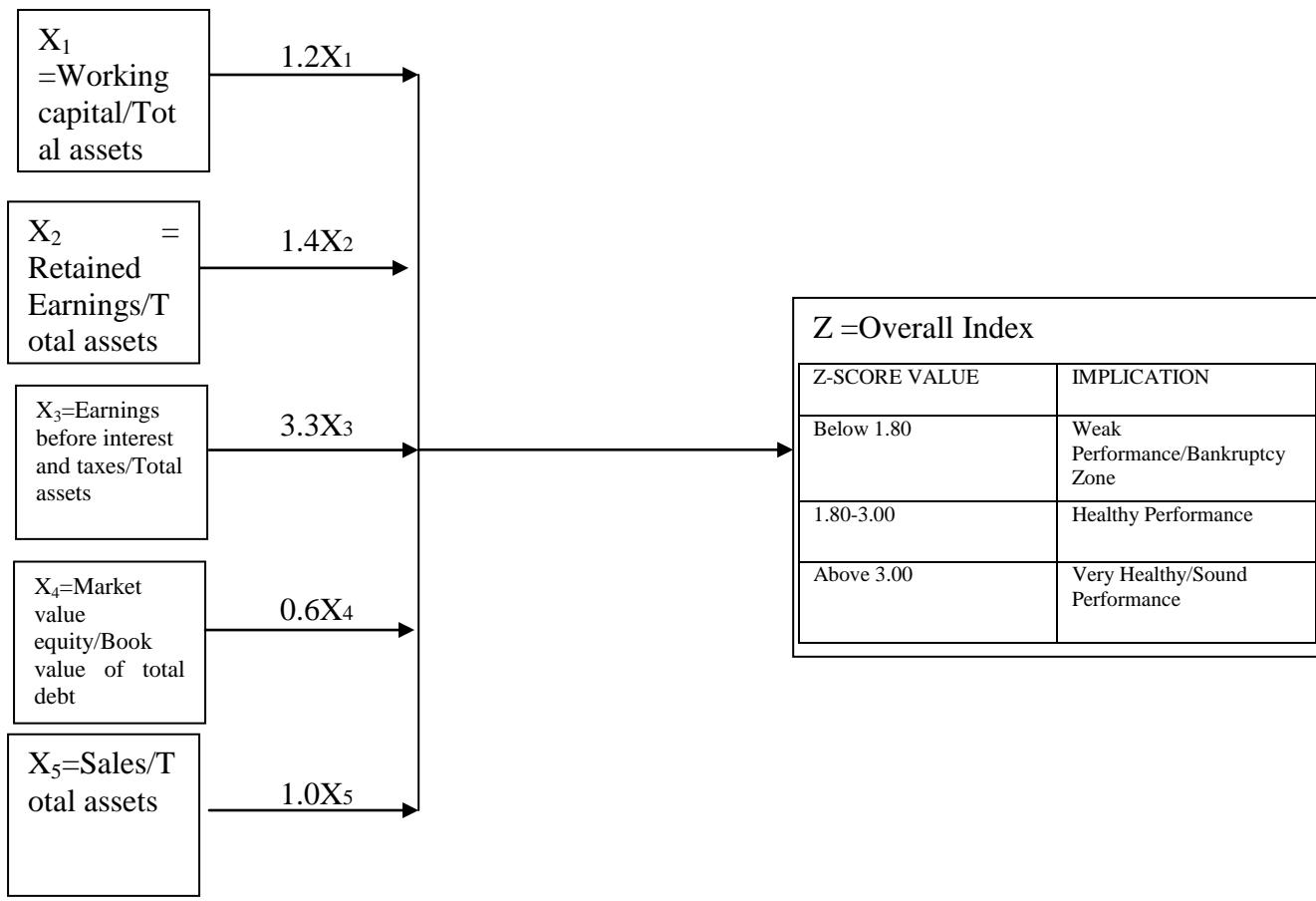
A study on financial performance and analysis using Altman Z-Score and its effect on stock price in the banking sector in Indonesian Stock exchange by (Prihatni & Zakaria, 2011) found all banks analysed as having financial difficulties with none scoring more than 2.60. The study explored whether banks have financial difficulties and its effect to companies's stock price in Indonesia. Data was gathered from banking sector during year 2004-2008 listed in Indonesian Stock Exchange. The results showed that all banks used in this sample are categorized in financial difficulties but in fact, those banks are still running their operation normally.

Discriminant analysis was employed to identify and explain key features of bank profitability levels in croatia. In the study by (Ante & Ana, 2013), data sample included balance sheet and income statement items of all banks in the Republic of Croatia which were active in two observed years: 2003 and 2008. Bank profitability was set up in the form of two categorical variables of profit or loss recorded and above or below average return on equity. The predictor variables were selected from various groups of financial indicators usually included in the empirical work on microeconomic determinants of bank profitability and data from the Croatian banking sector analyzed.

2.2 Conceptual Framework

The Altman 'Z' score was developed using large number of variables found to be significant indicators of corporate problems. Past studies with a list of twenty-two potentially helpful ratios were compiled for evaluation and eventually classified into five standard ratio categories. The final discriminant function for "Z" score is given as follows: $Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$. Where;

X_1 =Working capital/Total assets, X_2 = Retained Earnings/Total assets, X_3 =Earnings before interest and taxes/Total assets, X_4 =Market value equity/Book value of total debt, X_5 =Sales/Total assets and Z =Overall Index

Figure 2.1 Conceptual Framework**Independent Variables****Dependent Variable**

Source Researcher (2014)

Firms having a Z score of greater than 2.99 clearly fall into the "non-bankrupt" sector, while those firms having a Z score below 1.81 are all bankrupt. The area between 1.81 and 2.99 will be defined as the "zone of ignorance" or "gray area"

Research Methodology**3.1 Research Design**

The research design adopted is according to (Cooper & Schindler, 2003) to highlight in technical terms what is to be done. The research design is quantitative in nature and relies on longitudinal financial data collected for the period 2008 to 2013. This is used by the researcher in analysis to determine the financial performance of the SACCO sector in Kenya.

3.2 Scope of Study

This study cover the entire SACCO sector in Kenya and a random sample of thirty deposit taking Sacco's has been selected for the study. The researcher is confident that valuable insights and conclusions will be drawn from the financial analysis of the sector.

3.3 Target Population

The target population for this study is the 215 Deposit taking SACCOs which is the total registered with SASRA. Financial data is obtained from SASRA, the SACCO regulator for the 6 years under study and a comprehensive listing provided for licensed Deposit Taking SACCO. Altman 'Z' score used in analysis has the discriminating variables of liquidity, profitability, leverage, solvency, and activity ratios.

3.4 Sampling and Sample Design

The study has relied on random sampling technique to obtain financial data from on sampled SACCO's of interest. Researcher based sample selection on county classification and SACCO's capital base. Sample as noted by (Kothari, 2008) is a physical representation of the target population comprising all the units that are potential members of a sample. Total of 30 SACCO's selected is used in this study and are considered a representative of the SACCO sector analysis.

3.5 Data Collection Instruments and Procedure

The study has used secondary data that was provided by SASRA, the SACCO regulator using secondary data collection questionnaire. This data was obtained from the audited financial reports of sampled SACCO's and key financial information on the variables of concern discerned from these reports. Internet was also used to gather additional secondary information relating to the study.

3.6. Data Analysis

Data was collected and collated and discriminant analysis of the key variable undertaken. Discriminating variables of liquidity, profitability, leverage, solvency, and activity ratios were analyzed using the Altman 'Z' score in order to arrive at the study findings. An integration of both qualitative and quantitative methods were relied upon in the course of this study. The data obtained was subjected to various computations and analysis. In the analysis percentages, ratios, graphs and tabulations are done and appropriate references have been drawn. The analysis of the quantitative data was done using excel spreadsheets and Eviews programme.

3.7 Model Specification

The Z score discriminant model for the i th function is:

$$D_i = d_{i1}Z_1 + d_{i2}Z_2 + \dots + d_{ip}Z_p$$

Where z = the score on each predictor, and d_i = discriminant function coefficient.

The Altman Z score is used in the study; the matrix consists of various parameters of interest as explained and the final discriminant function for "Z" score given as:

$$Z = .012X_1 + .014X_2 + .033X_3 + .006X_4 + .999X_5$$

Data Analysis, Presentation and Interpretation

4.1 Introduction

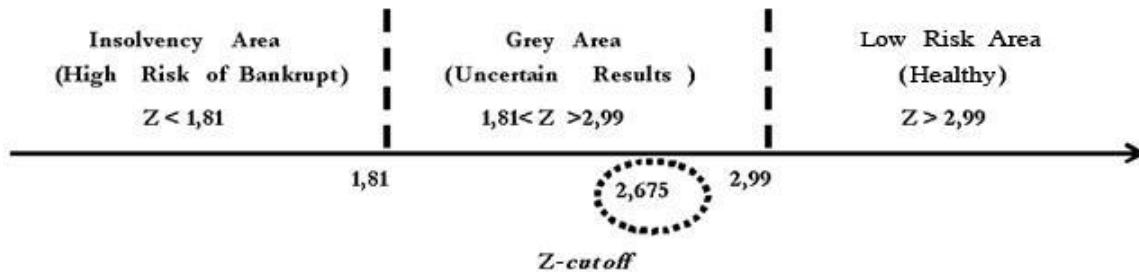
This section covers the analysis of the data, presentation and interpretation. The quantitative financial data collected using secondary data collection questionnaire is summarized in the form of tables and narratives.

4.2 Descriptive Statistics

The study results are presented in tables below to show results of Z scores computations and sector financial status for the period from 2008 -2013. These are descriptive statistics essential in identifying trend and statistical properties of the data. Economic statistician according to (Koutsoyiannis, 1977) gather empirical data, records them, tabulates them, charts them and then attempts to describe the pattern in their development overtime, they perhaps detect some relationship between the various economic magnitudes. The Z Scores from quantitative financial data collected from audited annual financial statements are statistics for analyzing the sectors financial performance.

4.3 Estimating the Altman Z Score

The Altman Z score model specified is in the form: $Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$ is applied to compute values for parameters X_1, X_2, X_3, X_4, X_5 and combined overall Z score value. Information has been collected from the audited financial statements on the variables of interest for computations as shown in the data collection questionnaire in Appendix 3. These results are applied in performance analysis and interpretation of the results is Z Score of less than 1.81 are highly risky and likely to go bankrupt; SACCO's with a score more than 2.99 are healthy and scores between 1.81 and 2.99 are in a grey area with uncertain results.

Figure 4.1: Z-Score Classification Areas

Source: (Danovi, 2010)

4.4 The Altman Z Score and Variable Potency

The main variables impacting Z scores are Liquidity, profitability, operating efficiency, equity, book debts and total assets turnover and are key variables in the Altman's Z score model. Variables of great influence deemed potent in study analysis are X_1 and X_4 , with other variables equally contributing to the scoring. When variable values in the overall scoring can authoritatively persuade, influence or force the management, the regulators and policy makers to act based on the state of the sector such is deemed potent. Table 4.1 below presents consolidated overall SACCO scores and column of the main variable of influence and deemed potent.

Table 4.1 Overall Z score Results for SACCO's

S.No	SACCO/ YEAR	2008	2009	2010	2011	2012	2013	Main Predictor Variable
No. 1	WAUMINI SACCO	3.75	3.20	3.19	3.37	3.70	3.60	X_4
No. 2	GITHUNGURI DAIRY & COMMUNITY SACCO LTD	3.67	3.24	1.39	1.62	1.71	4.60	X_4
No. 3	FUNDILIMA SACCO	3.65	2.74	3.80	2.16	2.36	2.87	X_1
No. 4	MUDETE TEA GROWERS SACCO	2.48	1.77	1.71	1.51	2.51	2.72	X_4
No. 5	KAKAMEGA TEACHERS SAVING AND CREDIT COOPERATIVE SOCIETY LIMITED	3.01	2.66	1.99	2.25	2.62	2.98	X_4
No. 6	KENPIPE SACCO	2.20	2.26	2.28	2.18	2.38	2.43	X_1
No. 7	IMENTI COOP SACCO	4.08	3.41	2.75	2.95	2.07	2.06	X_1
No. 8	THARAKA NITHI TEACHERS SACCO	1.91	1.98	1.90	1.92	2.28	2.40	X_1
No. 9	EGERTON UNIVERSITY SACCO	2.48	2.65	2.34	2.53	1.86	1.87	X_4
No. 10	WAKULIMA COMMERCIAL SACCO LTD	2.36	2.88	2.17	2.02	2.45	2.41	All Variables
No. 11	MAGEREZA SACCO SOCIETY LTD	2.47	2.12	1.92	4.09	2.22	1.90	X_4
No. 12	MERU SOUTH FARMERS SACCO	1.79	1.79	1.42	1.75	1.26	1.49	X_4
No. 13	KENYA POLICE SACCO	1.90	1.92	2.16	2.23	2.30	2.39	All Variables
No. 14	FARJI SACCO SOCIETY LIMITED	2.43	2.60	3.06	3.10	2.43	2.62	X_4
No. 15	GUSII MWALIMU SACCO	2.48	2.55	2.44	2.48	2.44	2.82	All Variables
No. 16	BORESHA SACCO (BARINGO TEACHERS SACCO)	1.15	1.19	1.45	1.48	1.43	1.58	All Variables
No. 17	STATE KENYA SACCO (KURIA TEACHERS SACCO)	1.73	2.08	1.77	1.75	1.93	1.96	All Variables
No. 18	K-UNITY SACCO	3.06	3.24	3.20	2.90	2.96	2.75	X_1, X_4
No. 19	JAMII SACCO SOCIETY LTD	1.83	1.92	2.19	2.34	2.52	2.68	All Variables
No. 20	KENVERSITY COOP SACCO	2.11	2.25	2.27	2.30	2.55	2.63	X_1
No. 21	KINGDOM SACCO SOCIETY LTD	1.92	1.41	2.10	2.22	1.85	1.78	X_1
No. 22	MASAKU TEACHERS SACCO	1.23	1.29	1.53	1.72	1.91	1.74	All Variables
No. 23	MURATA SACCO	5.98	2.64	2.41	4.02	3.75	2.35	All Variables
No. 24	NAKU SACCO SOCIETY LTD	1.99	1.96	2.14	2.10	2.34	2.34	X_1
No. 25	BURETI TEA GROWERS SACCO SOCIETY LTD	2.41	2.61	3.98	2.05	2.35	2.64	X_4
No. 26	IRIANYI SACCO	2.55	3.03	4.64	3.07	3.50	2.55	X_4
No. 27	BANDARI SACCO	2.55	2.41	2.73	2.92	2.97	2.96	X_4
No. 28	SHERIA SACCO SOCIETY LTD	1.76	2.03	1.77	1.93	1.88	2.21	X_1
No. 29	TAIFA SACCO SOCIETY LTD	3.02	2.80	2.36	2.97	3.22	2.63	X_4
No. 30	CENTENARY SACCO (DOM SACCO)	0.76	1.74	1.95	1.84	2.15	1.95	X_1

4.5 Financial Performance of SACCO's

The performance of the SACCO can be analyzed on the basis of Z scoring. The various bands presented in Figure 4.1 show classification used to rate a SACCO based on performance. The study presents the performance in clusters as shown below.

4.5.1 Very healthy SACCO's and Non Bankrupt SACCO's

Z score value above 3.0 represents a very healthy state and SACCOs that fall in this category are in the safe zone, a "non-bankrupt" area. Three SACCOs have consistent results above 3.0 marks in the period under study and are graphically presented in Figure 4.2 below.

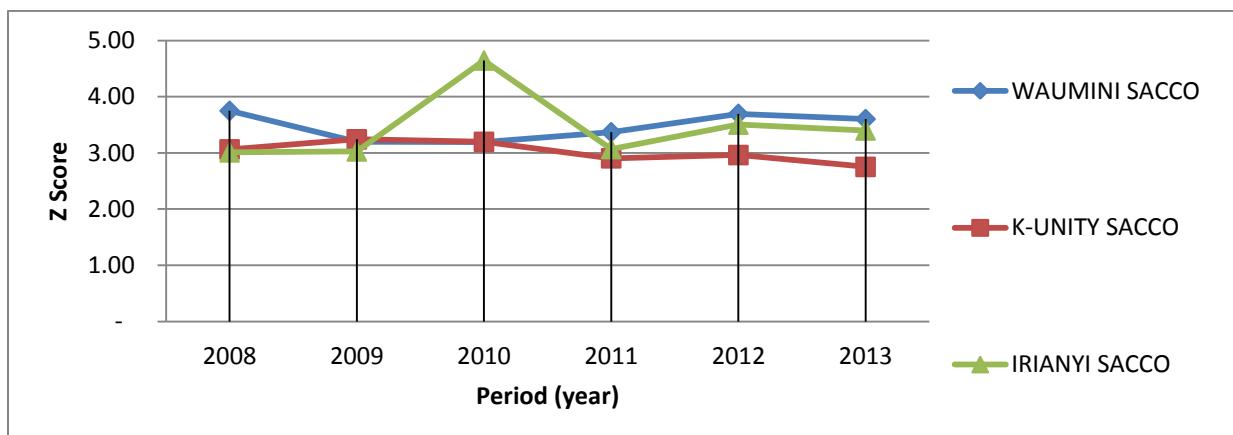


Figure 4.2: Z score Graph –Non Bankrupt Sacco's

4.5.2 SACCO's in Grey area with Uncertain Results

The scores of between 1.81 and 2.99 falls in the grey area presumed healthy. Computed Z score values for thirteen (13) Deposit taking SACCO's from the sample fall in the grey area. Figure 4.3 below comprise eight SACCO's in the category with increasing scores overtime.

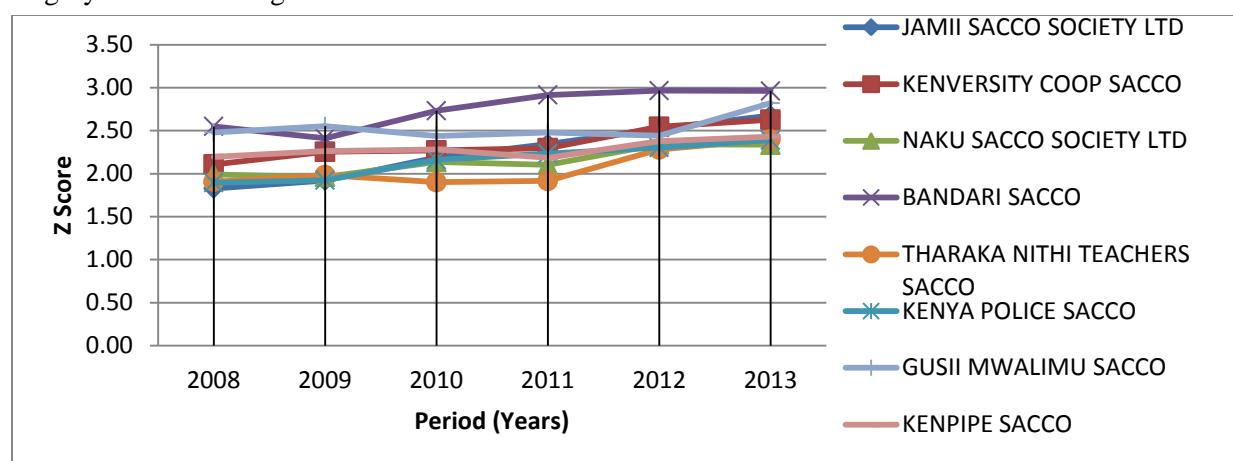


Figure 4.3: Z score for Jamii Sacco, Kiversity Sacco, Naku Sacco, Bandari Sacco, Tharaka Nithi Teachers, Kenya Police Sacco, Gusii Mwalimu and Kenpipe Sacco

Figure 4.4 Show five Sacco's with huge movement of scores in the healthy cluster.

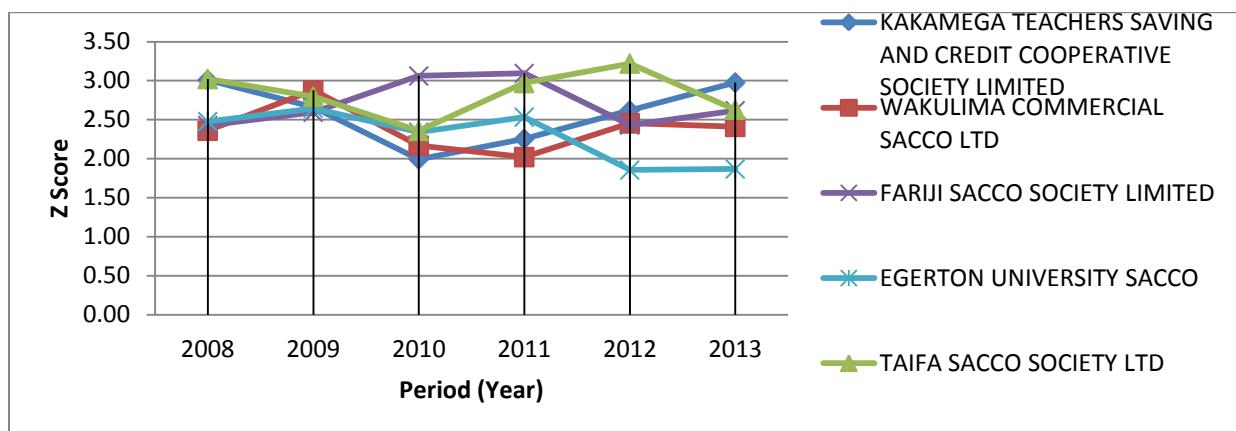


Figure 4.4: Z score graph for Kakamega Teachers Saving and Credit Cooperative Society Ltd, Taifa Sacco Society Ltd, Wakulima Commercial Sacco, Fariji Sacco Society Ltd and Egerton University

4.5.3 Results Falling within various Bands

Eleven Deposit taking SACCO's have results within different bands. Their scores fall within the zones of less than 1.81 , more than 2.99 and scores of between 1.81 and 2.99 meaning at various times were highly risky and likely to go bankrupt, were healthy or were in a grey area with uncertain results. The periodic drift of the Z score value within the bands can be explained by changes in specific predictor variable with impact and magnitude on overall z value on either side, i.e. an increase or reduction.

Figure 4.5 below is a category with Z scores steadily increasing overtime in the group.

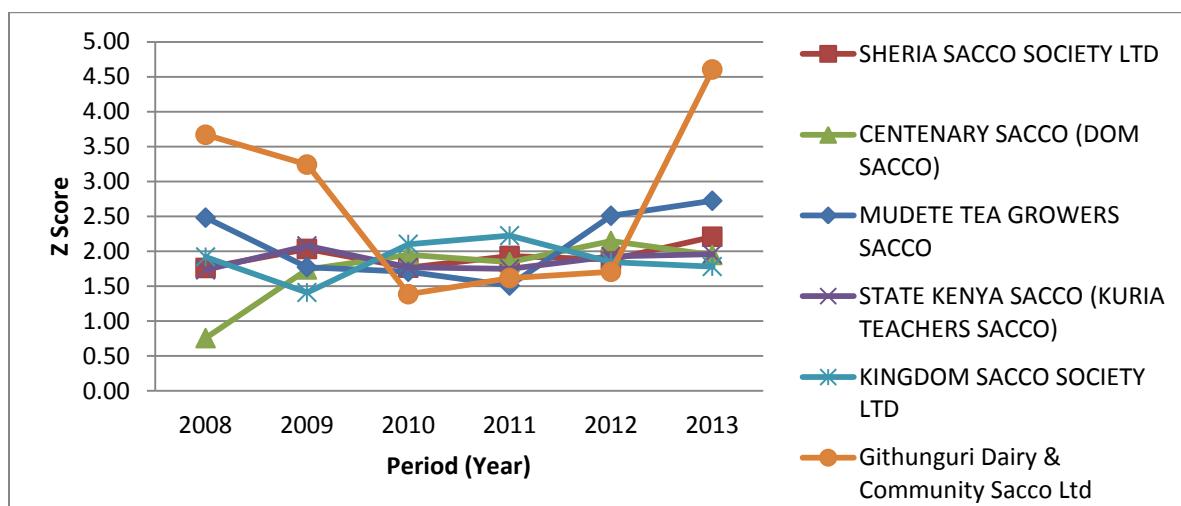


Figure 4.5: Steady Increase Z Scores graph for Sheria Sacco, Centenary SACCO, Mudete Tea Sacco, State Kenya Sacco, Kingdom Sacco and Githunguri Dairy & Community Sacco

Figure 4.6 below represents group of Sacco's that have declining Z scores in the category.

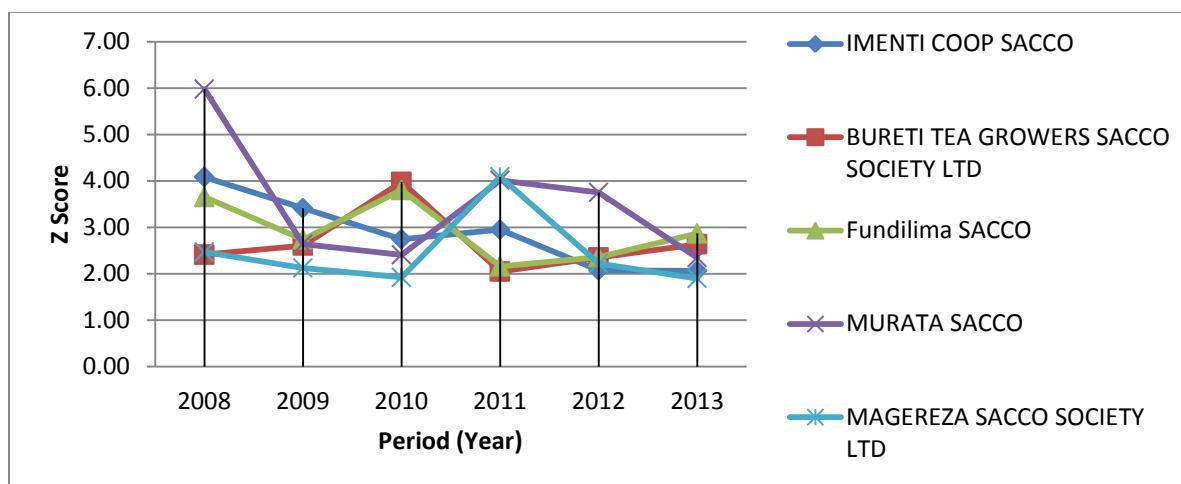


Figure 4.6: Declining Z Scores graph for Imenti Sacco, Bureti Tea Growers Sacco, Fundilima Sacco Murata Sacco and Magereza Sacco

4.5.4 Bankrupt Sacco's

Three Sacco's results in the study sample had overall Z score of less than 1.81 meaning weak performance, highly risky and likely to go bankrupt. Figure 4.7 represents three bankrupt Sacco's

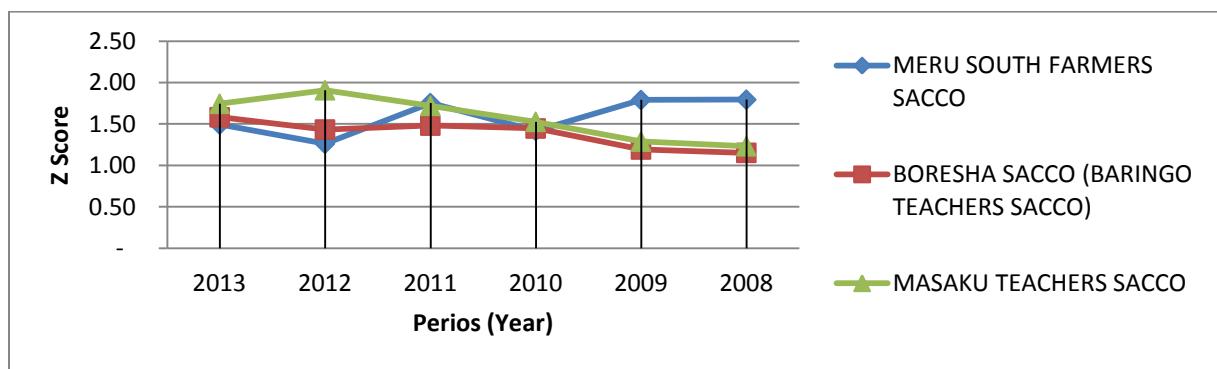


Figure 4.7: Z Scores Graph for three Bankrupt Sacco's

Overall in the period under study, three SACCOs have been consistently bankrupt, eleven Sacco's have results falling in the three bands, thirteen Sacco's have results in the grey area with uncertain results assumed healthy and only three are non bankrupt. These result show fairly strong finance position but a need to improve performance parameters for SACCOs in grey area and bankrupt zone and move them to non bankrupt position. The result vindicates SASRA's enhanced capital adequacy regulatory requirements for the sector.

4.6 Financial Stability

The z score will enhance sector financial stability if it enhances economic performance and contribute to sector confidence in the long run. To determine contribution of the Altman Z score we look at the trend overtime for the period under study and present the trend in graphs below and notes on contribution to the sectors financial stability.

4.6.1 Trending Very Healthy SACCO's

Two Sacco's in this group have positive slope meaning will continue to enhance performance and one Sacco on the decline. Figure 4.8 Show the trend, these results enhance the sectors finance stability.

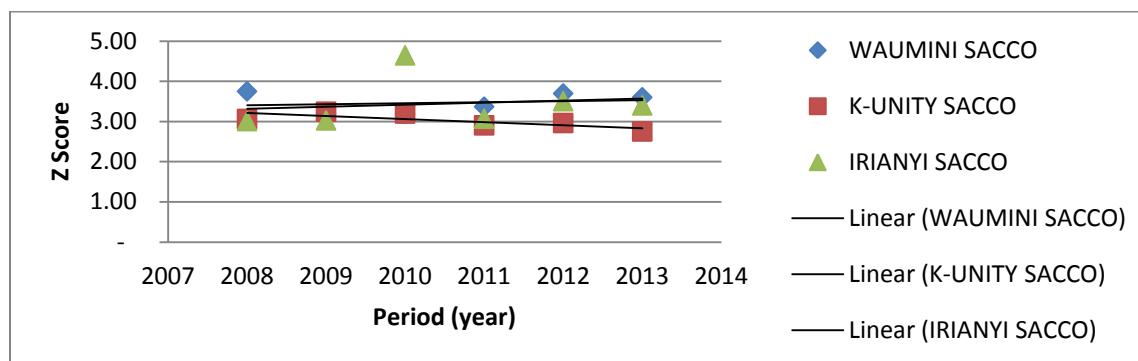


Figure 4.8: Z Scores Trend Lines for Three Non Bankrupt Sacco's

4.6.2 Trending SACCO's in Grey area with Uncertain Results

The scores of between 1.81 and 2.99 falls in the grey area presumed healthy. Figure 4.9 below show trending of eight SACCO's with a positive slope, a trajectory that contributes to enhanced finance stability and corroborated by audited financial report and presentations.

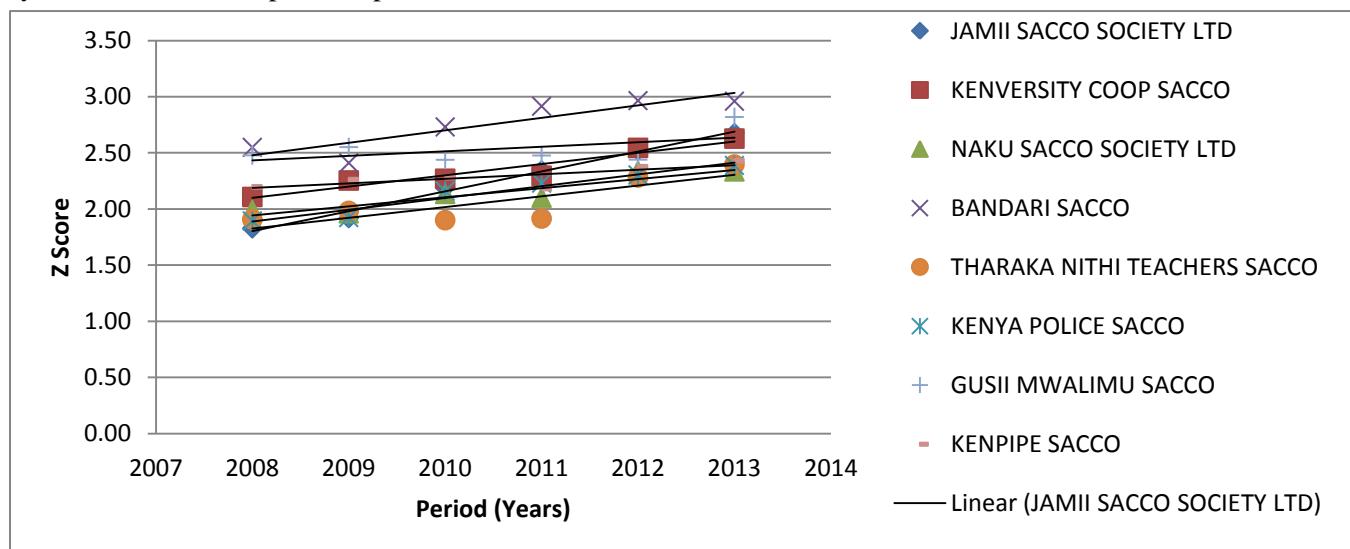


Figure 4.9 Trending Z score for Jamii Sacco, Keversity Sacco, Naku Sacco, Bandari Sacco, Tharaka Nithi Teachers and Kenya Police Sacco

Figure 4.9.1 below which represent treading of five SACCOs with huge Z score changes, show positive slope for three SACCOs and a negative slope for two SACCO and on overall contribute to sector finance stability.

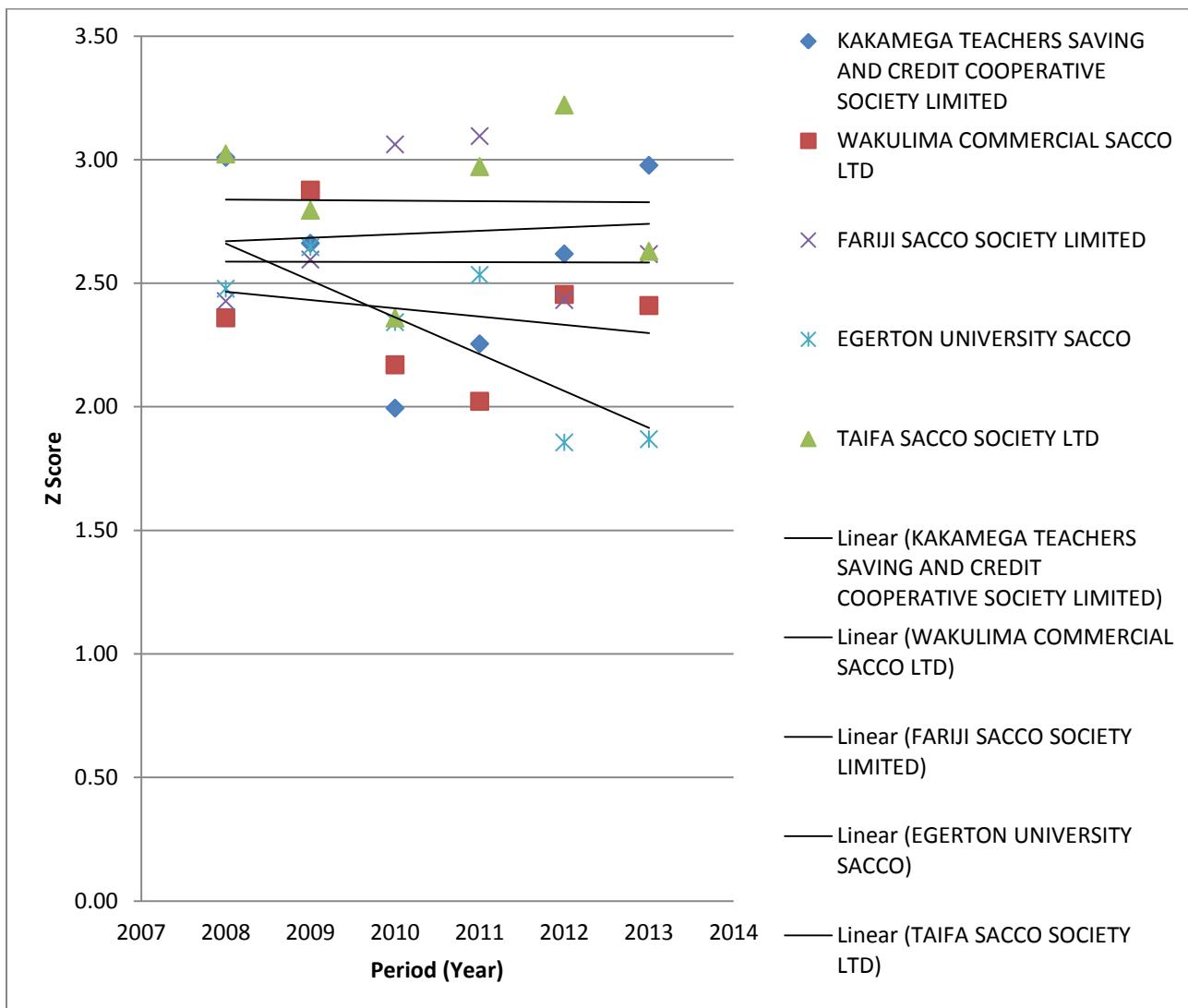


Figure 4.9.1 Z score trending for Kakamega Teachers Saving and Credit Cooperative Society Ltd, Taifa Sacco Society Ltd, Wakulima Commercial Sacco and Fariji Sacco Society Ltd

4.6.3 Trending SACCO's Falling within Various Bands

This group of SACCOs have value ranges within the three zones of less than 1.81 , more than 2.99 and scores of between 1.81 and 2.99. This means that at various times within the study period they were both highly risky and likely to go bankrupt, were healthy or were in a grey area with uncertain results. The trend for this group is presented in figures 4.9.2 to 4.9.5 and explanation of contribution to enhancing finance stability.

Figure 5.1 below show three SACCOs in this category that have a positive slope and contributing to enhanced sector confidence.

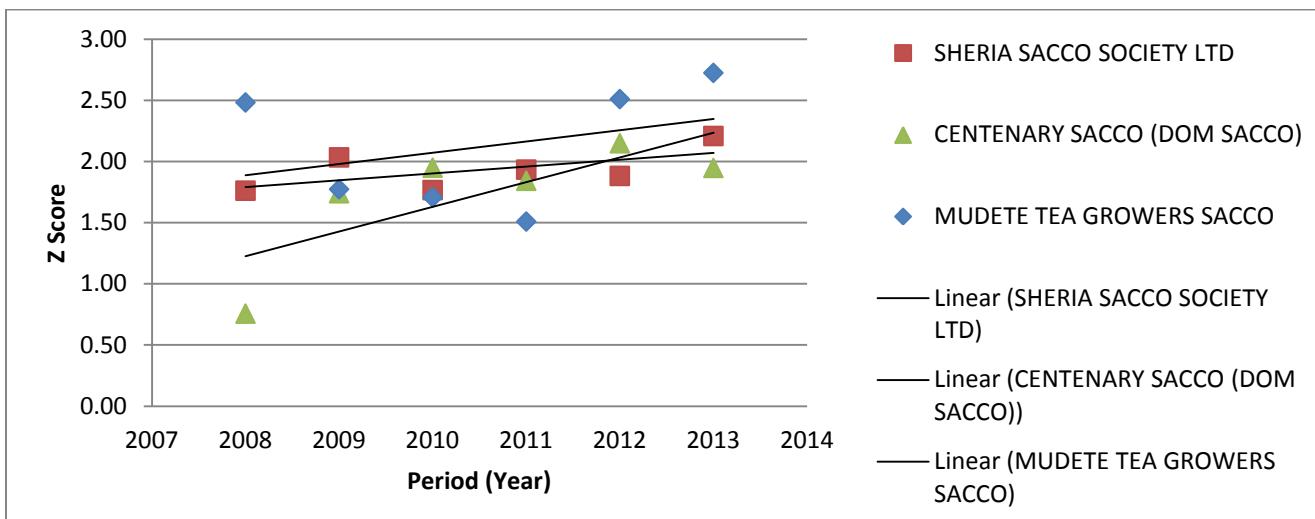


Figure 4.9.2: Treading Z Scores graph for Sheria Sacco, Centenary SACCO, and Mudete Tea Sacco)

Figure 5.2 below present SACCO's in this category with moderate positive slope and positive contribution to sectors finance stability.

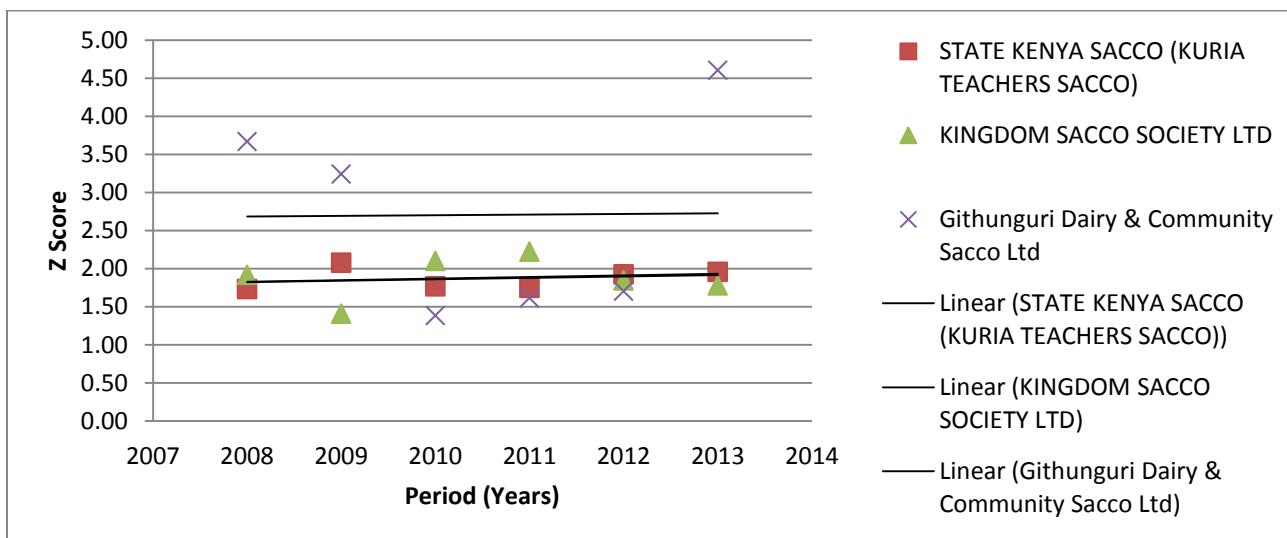


Figure 4.9.3: Treading Z Scores graph for State Kenya Sacco, Kingdom Sacco and Githunguri Dairy & Community Sacco

Figure 4.9.4 below is last cluster which comprise four SACCO's in this category, these are SACCOs with a declining Z score and which could erode finance stability in the sector.

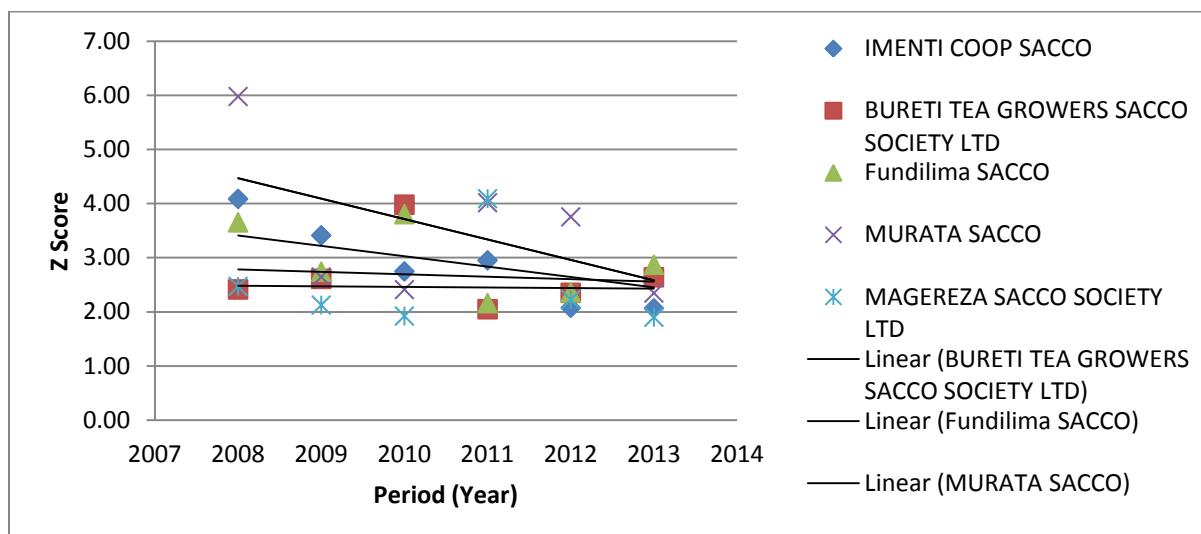


Figure 4.9.4: Trending Z Scores graph for Imenti Sacco, Bureti Tea Growers Sacco, Fundilima Sacco, Murata Sacco and Magereza Sacco

4.6.4 Trending Bankrupt SACCO's

Results for this group show positive slope for two Sacco and a declining slope in one Sacco out of the three in this category as shown in Figure 4.9.5. While the expectation is that they will fall bankrupt, an aggregate of two positive slope results will enhance sectors finance stability with hopes for recovery.

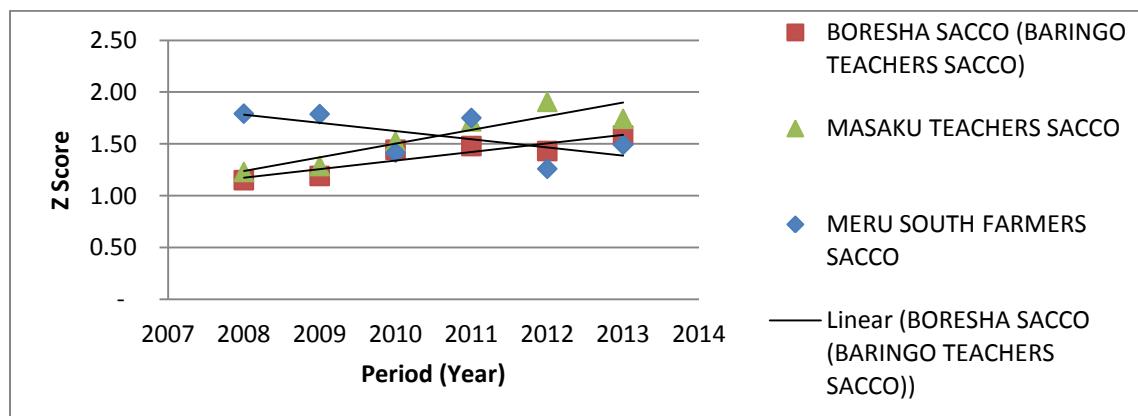


Figure 4.9.5: Trending Z Scores graph for Boresha Sacco, Masaku Sacco and Meru South Farmers Sacco

Overall the audited financial account, presentations and SACCO chairs reports supports these findings which are expectations of improved performance expect for six SACCOs with negative slope. The regulatory interventions such as capital adequacy requirements, mergers among others are therefore necessary to instill discipline and maintain sector financial stability.

Discussion Of Findings, Conclusion and Recommendations

5.1 Summary of Findings

This section presents a summary of findings from the study, conclusion and recommendations suggested by researcher. All findings are summarized in line with the objectives to show how the objectives of finance analysis have been achieved.

5.2 Z Score Variable Potency

Study reviews contribution and potency of the predictor variables such as liquidity, profitability, leverage, solvency, and activity ratios in scoring, represented by X_1, X_2, X_3, X_4 and X_5 . The study shows variables X_1 and X_4 having greatest influence and deemed potent, all other variables have equal influence in eight SACCO's. Overall the Altman Z Score Model is deemed potent and variables X_1 (working capital to Total assets) and X_4 (Equity to Total book debt) greatly impact SACCO performance.

Management should focus on issues of Liquidity, profitability, operating efficiency, equity, book debts and total assets turnover. The findings support audited financial account which also notes the expectation of an improved financial performance except for six SACCOs with a negative slope in spite of the expectations.

5.3 Sectors Financial Performance

Study findings reflect fairly good sector performance financially. Three SACCOs are in the non bankrupt area with scores above 2.99, a financially very healthy zone. A total of thirteen SACCOs are in the grey area presumed healthy, eleven SACCO's have scores within the three bands at different times meaning at various times were very healthy, in the gray area or bankrupt zone. These movements are explained by changes in predictor variables and three SACCOs are in bankrupt zone and predicted to fall bankrupt. There is a need to improve performance parameters for SACCOs in grey area and bankrupt zone and move their score to very healthy zone.

5.4 Z Scores Contribution to Financial Stability

Financial stability cannot be summarized in a single quantitative indicator and is considered a continuum in the sense that it is changeable over time and consistent with multiple combinations of the constituent elements of finance. Stable financial system will enhance economic performance in many dimensions while unstable financial detracts from economic performance. With a trajectory of a positive slope for twenty four out of the thirty Sacco's, this contribute to enhancing finance stability if the trajectory is sustained. This gives an indication of financial stability in the sector, capable of facilitating the performance of an economy and of dissipate financial imbalances that arise endogenously or as a result of significant adverse and unanticipated events. The study results contributes the smooth functioning of the key elements that make up the financial system hence improvement in financial stability. These findings are corroborating audited financial account which notes the expectation of an improved financial performance except for the six SACCOs with a negative slope in spite of noted expectations.

5.5 Conclusion

In view of the aforementioned analysis, this study concludes that variables X_1 and X_4 are significantly contributors in Z Scoring and model is potent tool for financial analysis, model application contributes to financial stability. This study has confirmed the use of multivariate statistical method in the Z Score, financial ratios can be classified in groups of profitable or non-profitable, groups of bankrupt and non bankrupt SACCOs. The study notes importance of performance on financial stability in the SACCOs.

The study notes the parameters of Liquidity, profitability, operating efficiency and total assets turnover (which are the key variables in the Altman's Z score) are very potent tools in the determination of the strength of a SACCO. This study concludes as well that the Altman Zscore analysis contributes to sector financial stability. SASRA, the SACCO regulatory agency is therefore correct in advocating for additional capital base for SACCOs to improve the Z Scores moving companies to none bankrupt zone.

5.6 Recommendations

Arising from the findings and conclusion above, the study recommends application of Z Score model, a Multiple Discriminate function in financial analysis. The Z Score formulation and its variables are potent to authoritatively persuade, influence or force the management, the regulators and policy makers to act based on the state of the sector. The model scores contribute to enhance stability in the sector and study recommends its use.

The study recommends regulators and policy makers for advocating capital adequacy requirements and urges SACCO Management to improve their liquidity, profitability, operating efficiency and total assets turnover if they must remain in business and meet capitalization threshold as set by SASRA, the regulator.

5.7 Suggestions for further Research

The study makes suggestions to researchers and investors to in addition to relying on common motivators of this study, namely financial ratios as fundamental factors to aswell look at impact of other factors like news, politics, economics etc.

The study makes suggestions for further research considerations in the extend of the observation period or the years under study. In 2013, there were 215 registered Deposit taking SACCO's by SASRA. With larger sample sizes more precise information is obtained about the population The policies applied by SASRA on sector's financial sustainability may be tested and compared for the purpose of benchmarking.

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