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INTERNAL CONTROL SYSTEMS AND CREDIT RISK OF REGISTERED DEPOSIT TAKING SACCOS IN WESTERN KENYA

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Abstract:
Kenya's Sacco industry plays a major role in the economic development of the nation. Internal control systems in Saccos have been implemented as one of the key measures necessary for promoting a healthy business environment by mitigating risks that arise with credit creation. This study's main objective was to determine the influence of internal control systems on the credit risk of deposit- taking Saccos in Western Kenya. The study was guided by agency theory, contingency theory and modern portfolio theory. The target population consisted of 212 respondents from the seven registered deposit-taking Saccos, who included the managers, accountants, auditors, and credit officers. A descriptive research design was adopted in this study. Simple random sampling was used to determine the sample size. Both primary and secondary data were used. Primary data was collected using questionnaires, while secondary data was obtained from audited financial statements of the Saccos using a secondary data collection sheet. Descriptive data included frequencies and percentages. Diagnostic tests comprised of: normality, autocorrelation, multicollinearity and heteroscedasticity. Inferential statistics consisted of correlation analysis, multiple regression analysis and ANOVA. The diagnostic tests conducted conformed to the linear regression requirements. The regression analysis results showed that control environment had a β of -0.089 with a p-value of 0.124, control activities had a coefficient of -0.191 with a p-value of 0.011, risk assessment had a β value of -0.225 and a p-value of 0.007, while monitoring had a β value of -0.217 and a p-value of 0.001. Control activities, Risk assessment and Monitoring had a significant negative relationship with credit risk, but the control environment had an insignificant relationship with credit risk. The

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independent variables of the study were negatively correlated to each other, with Control Activities having correlation coefficient of -0.517, Risk Assessment with -0.763 and Monitoring with -0.635. The regression model showed an R-squared of 0.612 while ANOVA had an F-statistic of 3.132 with a p-value of 0.007, which was greater than 0.005. It was recommended that Saccos review their policies and procedures regularly to meet the current market trends. Internal and external audits should be reviewed to check on variances and appropriate measures taken to deal with them. Credit monitoring should be done to ensure that loans are paid on time and that loans are issued to creditworthy individuals.

JEL: G21, G32, M42, M41, O16

Keywords: change management, leadership, digital transformation, tertiary education, health, public sectors, municipalities

1. Introduction

Internal control systems are the techniques that a company employs to manage risk and reduce the likelihood of fraud. Internal control systems have become indispensable both in the private and public sectors in today's world due to the evolution of sophisticated business practices using technology and the increasing size of business units. Both large and small organizations have built-in control systems to run their businesses efficiently and effectively so as to achieve their goals. The internal control system structure is made up of the control environment, procedures called control activities, information and communication, risk assessment and monitoring (Omondi, 2019).

The control environment is the foundational element for all other internal control elements, giving the organization structure and discipline. It concerns the creation of an atmosphere in which people can conduct their activities and carry out their control tasks effectively. It covers the integrity and ethical values of the organization; the parameters enabling the board of directors to carry out its governance oversight responsibilities; the organisational structure and assignment of authority and responsibility; the process for attracting, developing, and retaining competent individuals; and the rigor around performance measures, incentives, and rewards to drive accountability for performance (Omondi, 2021).

Control activities are actions established through policies and procedures that help ensure that the direction of management to reduce risks to the achievement of objectives is carried out. Control activities are carried out at all levels of the entity and can be preventive or detective in nature. Control activities typically consist of two elements: a policy that sets out what needs to be done, and a procedure for implementing the policy (Lidovolo, Otsyulah and Omondi, 2023).

Monitoring is the use of existing control assessments by management and third parties to identify and report issues to appropriate parties for corrective action.

Monitoring of internal control systems is necessary to ensure the effectiveness of controls. Monitoring ensures that internal control systems are present and continue to operate as intended. This is a non-stop method in any organization to decide the development and viability of set targets, ultimately to obtain its goals. Monitoring activities to be used in the study will include: separate evaluations of internal audit and performance (Omondi, Olweny and Miroga, 2019).

Credit risk is the identification, understanding, monitoring and managing of banking risk arising from the possibility of non-payment of loans. It arises when a borrower is unable to meet his/her obligations under a loan repayment agreement. The Saccos, who are the lenders, are faced with loss of interest and principal, interrupted cash flow, and sharp increases in debt recovery costs, which may cause bankruptcy if not appropriately managed. Regulated deposit-taking Saccos are required to maintain a minimum of 15% in non-performing loans. The credit risk standing in Saccos is calculated by dividing the non-performing loans by the total loans issued (Agang, 2020).

The Sacco movement in Kenya offers members and non-members alternatives for savings, credit, and investment. Loans made to members account for a sizable portion of a Sacco's assets. Some of these loans become non-performing and are declared bad debts, which causes a negative economic impact on these Saccos. The NPL is currently increasing, which has numerous negative effects on the sustainability of Sacco's profitability, ability to service debt, and ability to raise more capital (Ntoiti & Jagongo, 2021).

1.1 Statement of the Problem

Internal control systems are guidelines established by management to guard the assets of the firm and guarantee operational effectiveness. Internal control systems are essentially meant to serve as the first line of defence in safeguarding assets, reducing risks and preventing and detecting errors and fraud. Despite the implementation of internal controls, Saccos are still highly exposed to credit risk, with non-performing loans (NPLs) increasing from 5.2% in 2016 to 9.1% in June 2020 (The Kenya Financial Stability Report, 2020). Loans are the most important earning assets of deposit-taking Saccos, and the quality of loan portfolios must be jealously guarded. The overall amount of unremitted money as of September 2020 was an astounding Kshs 5.04 billion, up from Kshs 3.87 billion as of September 2019, and the biggest percentage of these funds, Kshs 4.31 billion, were owed to deposit-taking Saccos for loan repayment (SASRA, 2020). Credit risk has led Saccos to have liquidity problems, which in turn leads to some members withdrawing from the Saccos and eventual deregistration of some Saccos. Studies concerning internal control systems and credit risk have mainly focused on commercial banks, yet credit risk is a major concern for many Saccos in Kenya. Therefore, the need to establish the influence of internal control systems on credit risk in registered deposit-taking Saccos in Western Kenya.

1.2 Objectives of the Study

1.2.1 General Objective

- To examine the influence of internal control systems on the credit risk of registered deposit-taking Saccos in Western Kenya.

1.2.2 Specific Objectives

1) To assess the influence of the control environment on the credit risk of registered deposit-taking Saccos in Western Kenya.
2) To establish the influence of risk assessment on the credit risk of registered deposit-taking Saccos in Western Kenya.
3) To evaluate the influence of control activities on the credit risk of registered deposit-taking Saccos in Western Kenya.
4) To examine the influence of monitoring on the credit risk of registered deposit-taking Saccos in Western Kenya.

2. Literature Review

Agang (2020) conducted a study on internal control systems and credit risk among commercial banks listed on the Nairobi Securities Exchange in Kenya. A casual descriptive research design was used in this study. The target population was all of the Nairobi Securities Exchange's listed banks, and the census method was employed. Both primary and secondary sources of data were used, with primary data being collected using questionnaires. Multicollinearity and normality diagnostic tests were adopted. SPSS was used to analyze descriptive and inferential statistics. The study revealed that among commercial banks listed on the Nairobi Securities Exchange, there was a strong positive effect between control environment and credit risk.

Mwichigi (2019) studied the effects of internal control systems and credit risk in commercial banks listed in Nairobi Securities Exchange. The study adopted a descriptive research design. A census of all the listed banks was done. Primary data was collected with the use of questionnaires. Inferential and descriptive statistics were used for analysis of data using SPSS. The data analysed was presented using tables and graphs. According to the findings, there was a significant link between the control environment and credit risks.

Githui (2019) undertook a study on the effect of internal control systems on credit risk management in commercial banks in Kenya. The study employed a descriptive research design in the study. The study used a census since every respondent in the population participated in the study. The target population were respondents from 43 banks. Primary data was collected using questionnaires. Data collected was cleaned using Excel and analyzed using SPSS version 23 for descriptive and inferential statistics. The findings indicated a positive relationship between control environment and credit risk management in banks.

Katumba (2021) sought to explore the credit risk management practices of savings and credit cooperative societies: a case of Uganda Revenue Authority Sacco. A qualitative research design was used in the study. The research design was cross- sectional and descriptive in nature. The target population was the management of the Uganda Revenue Authority Sacco, while the sample size was five respondents who were chosen purposively. Structured interview guides were used to collect primary data. Analysis of data was done using descriptive and content analysis techniques. The findings revealed that following the debt collection policy, adherence to security policies in place, which include control activities are best credit risk management practice.

Shungula, Shavulimo and Kambura (2017) researched the Internal Determinants of Credit Risk Management of Deposit Taking Saccos in Nairobi County. The study employed a descriptive research design. Respondents were chosen using the stratified random sampling technique. The target population consisted of all branch managers and section heads in all deposit-taking Saccos in Nairobi County. Structured questionnaires were used to collect primary data. Data collected was summarized using descriptive statistics. Data was analyzed using SPP, and the data is presented in the form of tables and graphs. The findings showed that credit policy was statistically significant and was vital for the Saccos in the study in managing risk.

Bosire (2017) studied an assessment of the effects of credit risk management procedures on the financial performance of microfinance institutions in Kisii County. The study used a descriptive research design. The target population comprised of 45 respondents from all the 9 registered microfinance institutions in Kisii County. The respondents included: branch managers, risk managers, credit managers and credit officers from each institution. The census method was used while primary data was obtained from questionnaires with open-ended and closed-ended questions. Data was presented using tables and charts, and analyzed using descriptive statistics. The link between the dependent and independent variables was determined using regression analysis. The findings revealed that risk identification, risk analysis and risk monitoring have a significant effect on the financial performance of microfinance institutions.

Agang (2020) aimed to determine the impact of internal control systems on credit risk among commercial banks listed in Nairobi Securities Exchange, Kenya. A casual descriptive research design was used in this study. The population to be targeted encompassed all 11 listed commercial banks in Kenya. A census method was employed in the study, while purposive sampling was used to select the respondents. Both primary and secondary data were used in the study. Questionnaires were used to collect primary data. The study used descriptive and inferential statistics. The relationship between credit risk and internal control systems was investigated using inferential statistics and regression analysis. The findings of the study established that monitoring has a positive, substantial correlation with credit risk.

Mulinge (2019) examined the effect of the credit risk management framework on the financial performance of deposit-taking savings and credit cooperatives in Kenya. A descriptive research design was adopted. The target population of the study was credit

managers from all 166 registered Saccos in Kenya. The census method was used, where all units were targeted. Primary data was obtained by use of questionnaires. Analysis of data was done using SPSS, while the regression model was used to establish the relationship between the independent and dependent variables. The findings of the study showed a positive relationship linking credit risk monitoring to the financial performance of deposit-taking Saccos in Kenya.

2.2 Conceptual Framework

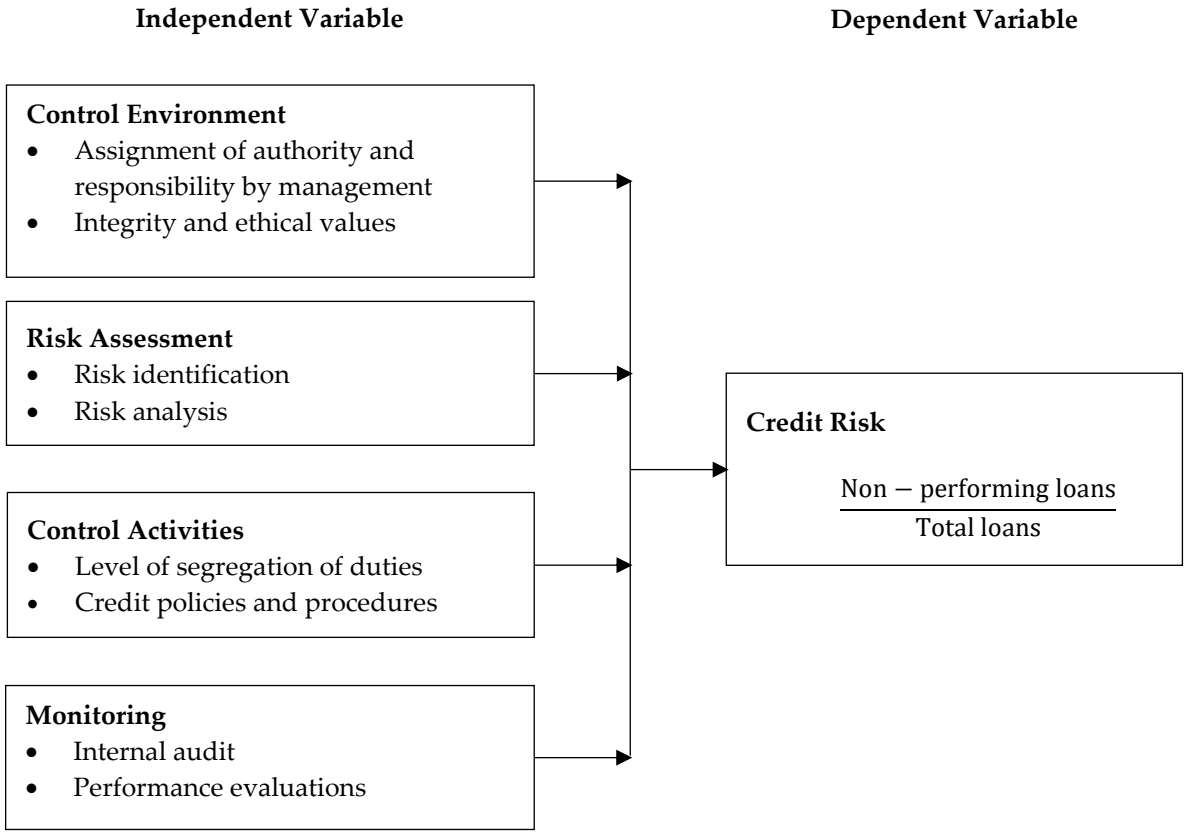

Figure 2.1: Conceptual Framework

3. Methodology

3.1 Research Philosophy

The study was guided by positivism, which operates on quantifiable observations whereby statistical analysis is obtained, and causal associations are identified. Positivism is effective in generating a research strategy to collect data which comes from observable reality, therefore contributing to the development of hypotheses. These hypotheses will be tested and confirmed, which can be used for further research. A positivist researcher follows a highly structured methodology in order to facilitate approval or disapproval of a hypothesis (Saunders, Lewis, & Thornhill, 2019).

3.2 Research Design

The study used a descriptive research design, which is aimed at determining the influence of internal control systems on the credit risk of registered deposit-taking Saccos in Western Kenya. The research design was important as it helps to identify the traits of the variables of interest, which will help to gather more information about the target population. In this study, the major emphasis was to establish the relationship between the variables; credit risk was the dependent variable, with internal control systems operating as the independent variable (Njiru, 2016).

3.3 Target Population

The target population consisted of 212 respondents from all registered deposit-taking Saccos in Western Kenya, which are 7 in total from the four counties which make up the Western region: Kakamega, Bungoma, Busia and Vihiga counties. The Sacco managers, accountants, auditors and credit officers were targeted.

The respondents were chosen based on their knowledge in accounting and their familiarity with the internal control systems in the Saccos.

3.4 Research Instruments

Primary data was collected using questionnaires. Primary data was used because of its objectivity since it was collected directly from the respondents. Questionnaires contained closed-ended questions. Questionnaires were used because they provide relevant information in the most reliable and valid manner (Taherdoost, 2016). Secondary data was obtained from the Saccos financial statements in 2021. Secondary data was employed to support the primary data since it's more comprehensive, and it showed the changes over time.

3.5 Data Collection Procedure

The questionnaires were distributed and collected after two weeks of issuance. This allowed the respondents enough time to respond to the questions. Financial statements from the Saccos were also requested for secondary data for the financial year 2020/2021.

3.6 Pilot Study

A pilot study is a preliminary study conducted on a smaller scale than the main study to determine whether the study can be carried out and, if so, how. It is carried out to enhance the main study's effectiveness and quality (Junyong , 2017). The pilot study was done in Kisumu County before actual data collection. The area was suitable for the pilot study since it was in the larger Western region, and Saccos in the area exhibit the same characteristics as those in the study. A pilot study with a sample of a tenth of the total sample with homogeneous characteristics is appropriate for the pilot study (Mugenda & Mugenda, 2013). The sample questionnaires issued represented 14% of all the sample questionnaires, which were 141, thus making them reliable for piloting. The results from the pilot test were not part of the sample population used in the study.

3.6.1 Reliability

Reliability concerns the extent to which a measurement of a phenomenon provides stable and consistent results. The Cronbach Alpha coefficient (α) was used to measure reliability since it was the most efficient when using the Likert scale. Reliability of the data to be collected was enhanced by issuing them to the pilot group. A questionnaire was considered reliable if α was greater than 0.7 (Taherdoost, 2016).

A reliability of α= 0.839 was obtained for the questionnaires, and hence deemed appropriate. The Cronbach alpha values for control environment, control activities, risk assessment and monitoring are 0.860, 0.880, 0.865 and 0.825, respectively, as shown in Table 1.

3.6.2 Validity

Validity explains how well the collected data covers the actual area of investigation (Taherdoost, 2016). In essence, validity is the extent to which results measure what they are supposed to measure. Validity was ensured using the pilot study so as to detect any ambiguities. Factor analysis was used to test for construct validity using the Kaiser – Mayer – Olkin and Bartlett's test. It measures how well one measure predicts an outcome for another measure. This measure was important in this study since it can be used to predict performance or behavior in a different environment. In this study, the connection is between internal control systems and financial performance. Questionnaires were reviewed using the expertise of the supervisors before being issued out to respondents.

The KMO and Bartlett's test were used to determine the suitability of the sample data for factor analysis. Values above 0.5 were considered suitable for conducting factor analysis. All the p-values of Bartlett's test were below 0.05, which indicated that the pilot study data were adequate for carrying out factor analysis. The adequacy of the samples was determined by Bartlett's test based on the significance of the Chi-square statistics.

3.7 Data Processing, Analysis and Presentation

Data was edited and summarized then analyzed by the use of Statistical Package for Social Sciences (SPSS). The diagnostic tests comprised: normality, autocorrelation, heteroscedasticity and multicollinearity. Descriptive statistics were presented using frequencies and percentages. Inferential statistics consisted of multiple regression and correlation analysis. Data was presented using graphs and tables.

4. Findings and Discussions

4.4.1 Control Environment and Credit Risk

4.4.1.1 Proper Assignment of Authority and Responsibility Reduces Credit Risk

From Table 4.3, 50.8% of the respondents strongly agreed, 33.9% agreed, 10.2% were neutral, 1.7% disagreed, while 3.4% strongly disagreed that proper assignment of authority and responsibility reduces credit risk in registered deposit-taking Saccos in Western Kenya. In the majority of the Saccos, roles and responsibilities are given

according to one's job description, which helps reduce credit risk since work is done effectively and efficiently. Saccos, therefore, do not incur extra training costs, and the work output is of high quality in the credit department, which in turn reduces credit risk.

4.4.1.2 Upholding of Ethical Values by Top Management Influences Credit Risk

According to Table 4, 39% strongly agreed, 44.1% agreed, 13.6% remained neutral, 2.5% disagreed, while 0.8% strongly disagreed that upholding of ethical values by top management influences credit risk in deposit-taking Saccos in Western Kenya. These findings can be translated to mean that the majority of the deposit-taking Saccos in Western Kenya have a management team that ensures that ethical values are upheld through equality of subordinates and adherence to the policies of the Saccos. When management upholds ethical values, credit policies and procedures will be followed before and after the issuance of loans to members. The right procedures will be followed when dealing with defaulters, which ultimately will reduce the number of non-performing loans.

4.4.1.3 The Level of Integrity of Top Management Supports Reduction of Credit Risk

Table 5 shows that the majority of the respondents (70.3%) either agreed or strongly agreed, whereas 10.2% either disagreed or strongly disagreed, 19.5% were neutral to the statement that the level of integrity of top management supports the reduction of credit risk in deposit-taking Saccos in Western Kenya. The findings imply that most of Sacco's top management deal with honesty and truthfulness in the execution of their roles. Strict measures are in place to enhance fairness in matters regarding credit appraisals and loan issuance. All laid down procedures regarding credit appraisals are followed, and only creditworthy applicants are selected. Any form of malpractice or unethical behavior in selecting applicants is dealt with promptly, and disciplinary measures are taken against the parties involved.

4.4.1.4 Management Acts with Integrity in Execution of Their Roles

The study sought to assess whether management acts with integrity in the execution of their roles in the Saccos. 56.7%, which represented the majority of the respondents either agreed or strongly agreed to this statement. Those who remained neutral were 21.2%, while those who either disagreed or strongly disagreed were 31.3% of all respondents. The majority of the Saccos uphold both moral and ethical values in the execution of their roles. Saccos can enhance this by developing a code of conduct that outlines the requirements for how everyone should conduct themselves in the course of business to facilitate the achievement of corporate objectives, thereby advancing Saccos and reducing risk and material misstatements. However, it is also evident that some of the people entrusted with management roles don't uphold integrity since they are reluctant to follow the policies and procedures laid down, hence the reported cases of fraud, which lead to the collapse of some Saccos.

4.4.1.5 Assignment of Authority and Responsibility is Efficiently Done by Management

The findings in Table 4.7 indicate that most (56.8%) of the Saccos' management properly assigned authority and responsibility to their employees. Seventeen percent (17.8%), on the other hand, seemed to disagree with this statement, while 25.4% were neutral. This implies that most Saccos have well-laid-out human resource policies which are adhered to. Management also takes part in the daily activities of the Saccos and is actively involved to ensure proper functioning of the Saccos. Having well-designed human resource policies plays a major role in boosting the performance of the Saccos since employees are well motivated and highly skilled in their various fields of work, hence abating rising credit risk levels.

On the other hand, in some Saccos, the assignment of authority and responsibility is not efficiently done. Saccos which do not have well-planned human resource policies face the danger of having unqualified and incompetent staff and loads of unfinished work since there are no clear roles of how work should be done. These Saccos eventually fail and record low profits due to high default rates since follow-ups on defaulters are not done efficiently.

4.4.1.6 Management Decisions Uphold Ethical Values

Results from Table 4.8 reveal that from 118 respondents, 29 (24.6%) strongly agreed, 34(28.8%) agreed, 28 (23.7%) were neutral, 23 (19.5%) disagreed, while 4 (3.4%) strongly disagreed that management decisions uphold ethical values. These findings indicate that most of the Saccos managers uphold ethical values. Decisions made by management are not out of their own personal interests but are in the best interest of the Sacco and the customers. Sacco management should endeavor to establish a code of ethics that depicts equality and fairness. They should also ensure that the code of ethics is adhered to by all the staff and shareholders. Upholding ethical values in decision-making plays a major role in ensuring that cases of fraud and embezzlement through unaccounted loans are done away with.

Twenty-two (22.9%) of the respondents who either disagreed or strongly disagreed show that some Saccos have a challenge in their management since the managers have a conflict of interest whereby loans are not issued out by merit of the applicants but through personal interests and bribes issued in order to acquire the loans. This leads to fraudulent activities in the Saccos, which negatively impacts the default rate.

4.4.1.7 Management Has No Conflict of Interest That May Sabotage Internal Controls

In response to the question as to whether management has no conflict of interest that may sabotage internal controls, 52.5% of 118 respondents either agreed or strongly agreed, 30.5% (36) remained neutral, while 20 respondents (17%) either disagreed or strongly disagreed. The findings imply that management decisions made in most Saccos are not influenced by personal interests. Internal control systems have been employed in the Saccos and have contributed greatly to the improved performance of these Saccos by

incorporating measures concerning credit risk management. When the management acts fairly, the decisions they make will impact the Sacco positively and will open up opportunities for more membership from both the customers, financiers and shareholders, increasing the Saccos asset base, which will cushion them from losses caused by non-performing loans.

However, 17% of the respondents disagreed, which reveals that in some Saccos, management has a conflict of interest, which may sabotage internal control systems. When internal control systems are sabotaged, Saccos face the problem of reduced productivity and give room for misuse of assets since there are no procedures and policies in place.

4.4.1.8 Conflict of Interest by Top Management May Negatively Impact on Credit Risk

Table 4.10 showed that 71 respondents (60.1%) either agreed or strongly agreed, 19.5% were neutral, and 20.3% either disagreed or strongly disagreed. Most of the respondents agreed with this statement, which implies that when management acts for personal benefits, they will cause the level of non-performing loans to rise. Credit risk will be elevated when management is not adhering to the credit policies, and proper procedures are not employed when issuing loans, which eventually leads to revenue reduction. High levels of credit risk lead to deregistration of Saccos and liquidity issues. These Saccos should have disciplinary measures against those who use their positions for personal gain.

4.4.2 Control Activities and Credit Risk

4.4.2.1 Segregation of Duties Reduces Default Risk

On the question of whether segregation of duties reduces credit risk, 61 respondents who represented 51.7% of the respondents strongly agreed to the statement, 33 (28%) agreed, 13 (11%) were neutral, while 11 (9.3%) either disagreed or strongly disagreed. Feedback obtained from the respondents revealed that Saccos assign duties to different people in the organization and there is a division of work. This ensures that every employee has a designated place of work and helps them focus on their work, which, in turn, increases the Sacco's profits. Default risk can be reduced greatly since every department, including the credit department, will work to ensure that loans are issued to creditworthy people. Defaulters will be charged based on their securities and guarantors to reduce the number of unpaid loans.

However, the lack of segregation of duties causes a lack of proper flow of work and creates a gap for fraudulent activities to take place. Creditors may fail to be evaluated according to the laid-down credit policies if the work is not done by the right people, hence risking increased non-performing loans.

4.4.2.2 Credit Policies and Procedures Are Adhered to in Credit Appraisals

The respondents were asked whether credit policies and procedures were adhered to in credit appraisals. 28.8% of the respondents strongly agreed, 39% agreed, 17.8% remained

neutral, 11% disagreed, while 3.4% strongly disagreed. The results indicate that Saccos have credit policies in place that they use to evaluate a customer's creditworthiness before issuing loans. These policies and procedures help customers know how much they can borrow, the interest rates to be used, the monthly instalments, and the period they are expected to repay. These policies also include alternative methods of payment in case the customers are unable to pay their loans, and this helps to prevent the Sacco from incurring losses on unpaid loans and bad debts. Credit policies and procedures are essential and should be reviewed regularly based on the Sacco's performance. When all stakeholders adhere to these policies, the rate of credit risk is likely to reduce, and performance will eventually increase.

Some of the Saccos do not adhere to credit policies, which eventually causes Saccos to have overloaning or underloaning issues, which will hinder them from meeting customers' obligations, which will lead to members withdrawing from the Saccos.

4.4.2.3 There Is Segregation of Duties in Your Sacco

Concerning segregation of duties, 61.9% of 118 respondents either agreed or disagreed, 18.6% were neutral, while 19.5% either disagreed or strongly disagreed. These findings affirm that deposit-taking Saccos in Western Kenya have segregated the duties in the Saccos to various personnel. Occurrences of fraud have mostly been attached to people being able to access all information in Saccos, leading to alteration and manipulation of information. Saccos should ensure that transactions such as approvals on expenditures and loan issuance are not done by the same people, but work should flow from one department to another. Roles to be done by each department should be properly defined. However, 19.5% of the respondents, as shown in Table 4.13, did not agree that Saccos have segregation of duties, which implies that some people in the organization have access to most, if not all, information and can be able to undertake fraudulent activities for their own personal interests without the knowledge of the management.

4.4.2.4 Security Measures are in Place to Prevent Access to All Information from the Institution by One Individual

In response to whether security measures are in place to prevent access to all information by one individual, the majority 63.6% agreed or strongly agreed, 225 disagreed, while 14.4% disagreed. These results show that measures were in place to prevent one person from accessing all the institution's information. Most of the Saccos have set up security rights and authorization measures that ensure that only authorized personnel can access the information. The reason for the occurrence of fraud is the lack of security measures in the workplace. Management should also ensure that, before any decision is implemented, it is reviewed to check for any errors. Security measures can be physical and also in the systems and software used.

4.4.2.5 Measures are in Place to Ensure That Regulations Regarding Approval Are Adhered To

Results obtained from the study concerning measures regarding approval depicted that 33.9% of the respondents strongly agreed, 28.8% agreed, 25.4% remained neutral, 10.2% disagreed, while 1.7% strongly disagreed. The majority of the Saccos have guidelines which are followed before approvals are made. This therefore means that there are clear policies and procedures of approval in the Saccos. This will enhance transparency, and individuals will be held accountable in case of fraudulent activities. 14 respondents who either disagreed or strongly disagreed are proof that there is still an issue regarding approvals. Some Saccos do not have policies on approval, which increases the chances of money being embezzled since funds are released for use without being approved.

4.4.2.6 Strict Adherence to Credit Policy Procedures Reduces Default Risk

From Table 4.16, most of the respondents were in agreement that strict adherence to credit policies reduces credit risk. Out of the 118 respondents, 76 (64.4%) either agreed or strongly agreed, 24 (20.3%) were neutral, and 18 (15.3%) either disagreed or strongly disagreed. A large number of Saccos follow credit policies both from the Sacco and those instituted by the Saccos Societies Regulatory Authority (SASRA). When the policies are implemented as intended, the number of non-performing loans reduces since the policies have a standard rate that they have to maintain, which should not be surpassed.

4.4.2.7 Restrictions to Access of All Information Enhance Reduction of Risk

It is evident from Table 4.17 that there were restrictions to access to all information in most (56.8%) of the Saccos. 32.2% of the respondents were neutral, while 11% of them either disagreed or strongly agreed. More than 50% of the respondents either agreed or strongly agreed, thus implying that Saccos have implemented strict security measures and controls, such as passwords and other relevant measures, to restrict information access to authorized personnel only. This also means that all information will be treated with strict confidence, which safeguards the welfare of members and shareholders. When information is handled by the relevant persons, the risk of having high non-performing loans will be reduced since the authorized persons will be able to easily follow up on default cases.

4.4.2.8 Variance Reports on Provision for Bad Debts Are Generated with Explanations

The results in Table 4.18 indicate that 19.5% of the respondents strongly agree that variance reports on provision for bad debts are generated with explanations, 34.7% agreed, 27.2% remained neutral, 16.9% disagreed, while 1.7% strongly disagreed. The findings signify that Saccos in western Kenya have varying reports on the provision of bad debts that give detailed explanations. The justification as to why a certain amount has been set aside as the provision is given, and any variances between the actual and budgeted amounts are shown. This practice enhances accountability, and the Saccos are able to gauge where it stands in terms of bad debts incurred.

Those who disagreed reflect that some Saccos lack the variance reports, which may cause the Saccos to write off a number of bad debts without thorough scrutiny. Variance reports should be generated regularly to be used for future projections.

4.4.2.9 Analysis of Variance Reports Enhances Reduction of Credit Risk

Table 4.19 indicates that the majority, 33.1% of the respondents, strongly agreed that analysis of variance reports enhances the reduction of credit risk, 22% agreed, 25.4% remained neutral, while 19.5% either disagreed or strongly disagreed. The overall results show that variance reports were generated and played a major role in the reduction of risk. Saccos use these reports to analyze their credit risk levels and work to ensure that the variances are reduced and that they meet their estimated targets. However, in Saccos where budget variances are not analysed, those who disagree are likely to overspend, and it may also lead to wastage of resources. Such Saccos will not be able to gauge whether their non-performing loans are on the rise or not, which could greatly affect the credit risk rate.

4.4.3 Risk Assessment and Credit Risk

4.4.3.1 Measures Are in Place to Identify Pertinent Issues Relating to Credit Risk

Regarding the question as to whether measures are in place to identify pertinent issues relating to credit risk, 44.9% respondents, who were the majority, strongly agreed. 45 respondents representing 38.2% agreed, 7(5.9%) were neutral, 12 (11%) either disagreed or strongly disagreed. The majority of the Saccos have put in place checks which help them evaluate credit-related issues. These measures help to identify major issues leading to high credit risk levels and how to avoid them. Rise in financial risk necessitates Saccos to train their employees on risk management as a way of minimizing risks.

4.4.3.2 Effective Analysis of Risk Is Frequently Done So as to Establish Priority Areas

Table 4.21 summarizes the results on whether frequent analysis of risk is done so as to determine priority areas in the Saccos. The feedback established that 74.6% of the respondents either agreed or strongly agreed, 15.2% remained neutral, while 12 respondents (10.2%) either disagreed or strongly disagreed. These findings suggest that most Saccos actively assess their operations to determine the causes of risk. Proper analysis identifies major priority areas which help the Saccos deal with specific issues and remedy the problems so as to meet their objectives and targets. On the contrary, Saccos that lack effective and frequent risk analysis make it difficult for them to identify what areas they need to improve on and how they can reduce the number of non-performing loans.

4.4.3.3 There Are Effective Credit Mitigation Techniques in Your Sacco

In regards to the question on credit mitigation techniques, out of 118 respondents, 44 (37.3%) strongly agreed, 43 (36.4%) agreed, 15 (12.7%) were neutral, while 16 (13.6%) either disagreed or strongly disagreed. The results generated provide evidence of

controls and preventive measures in Saccos against credit issues. Saccos have instituted various credit policies and procedures, which are regularly reviewed to help to prevent issues on credit risk and fraud. Credit appraisal techniques are also in place to aid in the proper evaluation of loaning. However, despite the majority of the Saccos having credit mitigation techniques, some Saccos still lack them. This leads to situations where Saccos are at risk of fraudsters and malpractices, which may go unnoticed.

4.4.3.4 Risk Mitigation Techniques Are Frequently Evaluated for Improvement

Concerning risk mitigation techniques, Table 4.23 portrays that Saccos frequently evaluate the techniques for improvement. 26.3% of the respondents strongly agreed that risk mitigation techniques were frequently evaluated, 31.4% agreed, 32.2% were neutral, while 10.1% either disagreed or strongly disagreed. The findings show that most Saccos regularly evaluate and modify their risk mitigation strategies. This ensures that the Saccos are ready for any new threats from fraudsters. It also ensures better risk mitigation techniques are implemented in future. Risk mitigation techniques reduce the occurrence of risk-related activities and open more opportunities.

10.1% of the respondents either disagreed or strongly disagreed, which reveals that some of the Saccos risk mitigation techniques are not frequently evaluated for improvement. If the Saccos fail to mitigate risks, they are likely to face more threats, which can negatively impact the operations of the Saccos, such as credit risk.

4.4.3.5 Credit Risk Assessment Reports Are Frequently Prepared and Acted Upon

The purpose of the study was to determine the respondents' opinions regarding the creation of credit risk assessment reports. The majority (64.4%) of the respondents agreed, 17.8% either disagreed or strongly disagreed that credit risk assessment reports were frequently prepared and acted upon, while 21 respondents remained neutral. Most of the respondents agreed with the statement that credit risk assessment reports are frequently prepared and acted upon. This practice is beneficial since any variances are detected early enough, and the situation can be salvaged before it worsens. It also helps Saccos gauge whether their performance is improving or declining and focus on the achievement of the set objectives.

Some of the Saccos' credit risk assessment reports are not frequently prepared and acted upon. Saccos without frequent credit assessment reports are prone to risks which could have been avoided. These Saccos cannot be able to track their progress and are vulnerable to not only financial risk but also misappropriation of funds.

4.4.3.6 Identification Issues Relating to Credit Risk Enhance Credit Risk Reduction

Respondents were asked whether the identification of pertinent issues relating to credit risk enhances credit risk reduction. 34.7% strongly agreed, 28% agreed, while 22.9% were neutral. Some of the respondents (14.4%) either disagreed or strongly disagreed. From the results majority agreed, which implied that pertinent issues related to credit risk are acted upon immediately, which in turn causes credit risk reduction. Risks need to be

identified through various means, such as performance evaluations and customer feedback. These pertinent issues should be treated as priority areas and stern actions taken to ensure that they do not recur.

4.4.3.7 Analysis of Risk-Prone Areas Supports Reduction of Credit Risk

From Table 4.26 Majority of the respondents agree that analysis of risk-prone areas supports the reduction of credit risk. 59.3% of the respondents either agreed or strongly agreed, 28.8% were neutral, while 11.9% either disagreed or strongly disagreed. Risk assessment procedures are enhanced in these Saccos to identify risk-prone areas. The risk-prone areas are closely monitored to ensure that risks are minimized. When the Sacco identifies its risk-prone areas, it is able to put in place measures that ensure that credit risks are not elevated. Risk-prone areas, such as investments, should be evaluated to ensure that the returns are worth the risks. Issuance of loans to members should also be closely monitored to prevent defaults.

4.4.3.8 Effective Implementation of Credit Mitigation Techniques Reduces Default Risk

In Table 4.27, 30.5% strongly agreed, 32.5% agreed that effective implementation of credit mitigation techniques reduces default risk, 24.6% remained neutral, while 12.7% either disagreed or strongly disagreed. The majority of the Saccos have implemented effective credit mitigation techniques. Credit mitigation techniques employed by Saccos include credit policies and procedures, credit appraisals and risk management systems. Employees need to be trained on risk management practices to reduce default risks. Saccos could also employ the services of auditors who give advice on ways of mitigating the risks. Credit mitigation will positively impact on the performance of the Sacco.

4.4.3.9 Frequent Evaluation of Credit Mitigation Techniques Enhances the Reduction of Default Risk

Findings in Table 4.28 indicate that out of 118 respondents, 25 (21.2%) strongly agreed, 49 (41.5%) agreed, 23 respondents remained neutral, while 17.8% of the respondents either disagreed or strongly disagreed that frequent evaluation of credit mitigation techniques enhances the reduction of default risk. The greater percentage of Saccos frequently evaluate credit mitigation techniques to ensure they are up to date. Fraudsters always devise new methods of committing fraud, so Saccos have to also upgrade their mitigation techniques to be able to curb these malpractices.

4.4.3.10 Frequent Preparation of Credit Risk Reports and Prompt Action Supports Reduction of Default Risks

The results from the study concerning frequent preparation of credit risk reports reveal that out of 118 respondents, 66.1% of the respondents strongly agreed or agreed, 14.4% were neutral, while 19.5% of the respondents either disagreed or strongly disagreed. Most of the Saccos in Western Kenya frequently prepare credit risk reports, and

information obtained from the reports is acted upon with immediate effect. Feedback from the reports is vital in financial decision-making. Financial risks can be reduced by taking corrective measures based on the reports. These reports ought to be prepared regularly so as to deal promptly with emerging issues.

4.4.4 Monitoring and Credit Risk

4.4.4.1 Internal Audit Staff Are Involved in Credit Risk Identification Measures

From the findings in Table 4.30, 58 respondents (49.2%) strongly agreed that internal audit staff are involved with credit risk identification and mitigation measures. 27.1% agreed,9.3% were neutral, while 14.4% either disagreed or strongly disagreed. These findings show that the internal audit department plays its role as required. The internal audit staff are required to detect any loopholes in the credit management process and mitigate the risks to avoid further threats. The internal auditors were thus playing their role of monitoring on time, and preventive measures were being taken, which in turn led to reduced credit risks. 17 respondents who disagreed represent some Saccos that still do not have an effective internal audit department, and risks are still on the rise without being identified, which leaves gaps for fraudulent activities to take place.

4.4.4.2 Internal Auditors Prepare Objective Reports Relating to Credit Risk

The study sought to establish whether internal auditors prepare objective reports in relation to credit risk. The majority (75.4%) of the respondents agreed with this statement, 12.7% remained neutral, while 11.9% either disagreed or strongly disagreed. It can be concluded that objective audit reports are prepared, and necessary actions are taken to deal with the auditors' recommendations. The reports on credit risks help the Saccos to act on any deviations from the planned budget and help the Sacco to gauge its overall performance in terms of non-performing loans. Failure of preparation of audit reports causes laxity, which threatens the performance of the Sacco, and they may find themselves unable to meet their client obligations due to a high number of non-performing loans.

4.4.4.3 Internal Audit Reports on Credit Risk Are Acted Upon Promptly by Management

Respondents were asked to express their views on whether internal audit reports on credit risk were acted upon promptly by management. Out of 118 respondents, a majority of 76 respondents (64.4%) either agreed or strongly agreed that internal audit reports were acted upon by management. 26 respondents remained neutral, while 16 respondents (13.6%) either disagreed or strongly disagreed. Most Saccos have measures in place to deal with arising issues in the shortest time possible. There were no delays in implementing the auditors' recommendations, hence the chances of the occurrence of fraudulent activities were minimized. Management should therefore ensure that there is no backlog of activities and that matters are dealt with as they arise. These help to keep

the management on its toes and to be on the lookout for any malpractices, especially in loan management.

However, in some of the Saccos, internal audit reports on credit risk are not acted upon promptly by management. This could bring about poor performance since the recommendations given by the auditors are not being implemented. If the auditors have given advice on how to reduce the rate of credit risk and action is not taken, then credit risk will be elevated in these Saccos.

4.4.4.4 Performance Evaluation Is Regularly Done in Your Sacco

The study sought to find out what the respondents perceived of performance evaluation being done in Saccos. 19.5 % of the respondents failed to give an objective answer, 15.3% either disagreed or strongly disagreed that performance evaluation is regularly done in Saccos, while 15.3% either disagreed or strongly agreed. These findings imply that Saccos have put in place procedures for measuring the performance of the Saccos. The actual results are compared to the budgeted ones, and deviations are known.

Regular review of policies and procedures to align with the current economic situation is also done. Through the various monitoring activities in the Saccos, a Sacco can evaluate where it stands, whether profit margins are increasing or decreasing. Performance evaluations can also be conducted, with employees regularly appraised based on their work performance. Saccos which do not evaluate their performance regularly may cause stagnation of the operations of the Saccos since they are not changing with the current times and have no clear guidelines on how they can improve performance through the reduction of non-performing loans.

4.4.4.5 External Audit Reports Are Acted Upon for Improvement

Table 4.34 reveals that the majority (59.3%) of the respondents either agreed or strongly agreed that external reports are acted upon for improvement. 31.4% were neutral, while 9.3% either disagreed or strongly disagreed with the inquiry. From the foregoing results, Saccos have employed the services of external auditors in their operations. External auditors' reports are usually objective and free from bias and self-interest since independence is upheld. Reports from these auditors are used as reference points to take corrective measures, hence they are acted upon by the management. Auditors give recommendations on how to solve problems and prevent them in the future.

4.4.4.6 Involvement of Internal Audit Staff in Credit Risk Identification Reduces Risks

Respondents were asked their view on whether the involvement of internal audit staff in credit risk identification reduces default risks. 69 (58.5%) out of 118 respondents either agreed or strongly agreed, 30 (25.4%) respondents were neutral, while 18 (16.1%) respondents either disagreed or strongly disagreed. The results confirm that Sacco audit staff involve themselves in risk identification and mitigation. It is the role of the audit staff to identify, reduce and eliminate risks in Saccos. When the audit staff engages in risk mitigation and identification, Saccos will be able to deal with the risks promptly since

they have measures in place to reduce them. This also means that anomalies will be identified quickly and improvement measures will be implemented. Through these measures, financial performance will be improved by reducing credit risk.

4.4.4.7 Objectivity of Internal Audit Reports Helps in Curbing Default Risk

Concerning objectivity of internal audit reports and the reduction of credit risk, 55.1% of the respondents either agreed or strongly agreed, 30.5% were neutral, while 14.4% of the respondents either disagreed or strongly disagreed. The results portray that the majority of the respondents were in agreement that objective internal audit reports help in curbing default risk. Audit reports should present the results of the Saccos as they are, so as to determine the appropriate measures to take. Audits should be carried out regularly in the Saccos to identify pertinent credit risk areas and make improvements. These objective reports will enhance transparency and accountability in the Saccos. Saccos will be able to know the areas where more security measures need to be taken, and cases of misappropriation and embezzlement of funds will be eliminated.

4.4.4.8 Prompt Action of Internal Audit Reports by Management Reduces Credit Risk

The results in Table 4.37 indicate that 71 (60.2%) respondents either agreed or strongly agreed, 30 (25.4%) remained neutral, while 17(14.4%) disagreed or strongly disagreed that prompt action of internal audit reports by management reduces credit risk. These findings implied that many respondents support the fact that prompt action of internal audit reports leads to a reduction of credit risks, which also leads to improved financial performance. The Saccos should identify risk-prone areas in the Saccos and take the necessary corrective measures. The management ought to constantly review the audit reports to evaluate whether their performance is as expected or not. Lack of prompt action on internal audit reports may neglect major issues which may affect the Sacco's performance negatively.

4.4.4.9 Regular Evaluation of Non-Performing Loans Reduces Default Risk

The study sought to assess whether regular evaluation of non-performing loans reduces default risk. 67 respondents (56.8%) out of 118 respondents agreed or strongly agreed, 31 (26.3%) were neutral, while 20 (16.9%) disagreed or strongly disagreed. The findings infer that Saccos have regular evaluation of their non-performing loans. Depending on the policies of a Sacco, they review their non-performing loan rate according to those policies. In order to improve their performance and remove inefficiencies in the Sacco, frequent evaluation should be undertaken. Lack of regular evaluation of non-performing loans implies that the Sacco cannot be able to determine if their rates of non-performing loans are increasing or decreasing.

4.4.4.10 Pro-Active Action of External Audit Reports Reduces Default Risk

In response to whether proactive action of external audit reports reduces default risk, the majority of the respondents, 73 (61.9%), agreed or strongly agreed, 26 (22%) were neutral,

while 18 (16.1%) either disagreed or strongly disagreed that proactive action of external audit reports reduces default risk. This implied that measures were taken in accordance with the external audit reports, and any variations were dealt with adequately. The reports provide explanations on any significant variances and steps to avoid them in future. Saccos have embraced new technologies in their operations to combat credit issues arising from external audit reports.

4.5 Diagnostic Tests

Statistical tests were performed on linear regression to assess normality, autocorrelation, multicollinearity, and heteroscedasticity.

4.5.1 Normality

The term normality refers to the presumption that data has a normal or Gaussian distribution and that the populations from which the samples are drawn have a normal distribution (Ghasemi & Zahediasl, 2012). A normality test was carried out to determine the statistical methods to be used to analyze data. Normality was diagnosed using the Shapiro-Wilk test, which examines whether the variables follow a normal distribution in the population. Statistical ranges of the Shapiro-Wilk test range from 0 to 1, with 1 being a perfect match, while the p-values of more than 0.05 depict normality. The Shapiro-Wilk test is based on the hypothesis that;

H_0: A variable is normally distributed.

If the alpha value is more than the p-value, you fail to reject the null hypothesis and don't accept the alternative hypothesis.

From the findings in Table 4.40, control environment, control activities, risk assessment and monitoring had p-values of 0.071, 0.068, 0.061 and 0.057, respectively. The p-values of all the variables were above 0.05, hence we will fail to reject the null hypothesis, which depicts that the data is normally distributed.

4.5.2 Autocorrelation

Autocorrelation is a data characteristic showing the level of correlation between the values of the same variables over various time intervals. It is tested to ensure that the observations are independent and there is no correlation between consecutive residuals. Autocorrelation was tested using the Durbin-Watson test, whose test statistic ranges from 0 to 4. If the value is less than 1.5 or greater than 2.5, then there is potential correlation, but if the value is between 1.5 and 2.5, then there is no problem of auto-correlation (Anderson , 2012).

The value obtained of 1.91 in Table 4.41 indicates that there is no auto-correlation hence independence of the residuals.

4.6.3 Multicollinearity

Multicollinearity describes a perfect or linear relationship between two or more regression variables (Alin, 2010). When the independent variables in the regression

model have a high degree of correlation, multicollinearity arises, which makes it difficult to interpret the model as it undermines the significance of the independent variables, hence the assumption of non-multicollinearity. Multicollinearity was tested by computing the Variable Inflation Factors (VIF) and their inverse, which is the tolerance. The VIF determines the strength of the correlation between the independent variables. VIF statistical range is from 0 to 10. VIFs above 10 and tolerances below 0.1 indicate multicollinearity severity. Results from Table 4.42 show that the Variance Inflation Factor values were less than 10, which means that the variables were retained in the model and the tolerance values were above 0.1, depicting that there was no multicollinearity.

4.5.4 Heteroscedasticity

A change in the distribution of the residuals over the range of the measured values is known as heteroscedasticity (Rosopa, Schaffer, & Schroeder, 2013). To satisfy the regression assumptions and to be able to test the results, the residuals should have a constant variance (homoscedasticity). In linear regression, heteroscedasticity is problematic because it presumes that all of the residuals come from a population with a constant variance. Heteroscedasticity will be measured using the Breusch Pagan test to determine if the variance of the errors from the regression is dependent on the values of the independent variables. The BP test is a chi-squared test, which states that if the test statistic has a p-value of below 0.05, then we fail to accept the null hypothesis and heteroscedasticity is assumed to be present. If the p-value is above 0.05, the data is considered homoscedastic. From Table 4.43, the p-value is 0.1326, which is greater than 0.05; hence, we will accept the alternative hypothesis, which states that homoscedasticity is present.

4.6 Inferential Statistics

Inferential statistics were used to determine the relationship between the independent variables and the dependent variable. In order to determine the relationship between the variables, correlation analysis and multiple regression analysis were used.

4.6.1 Correlation Analysis

Correlation analysis is a measure used to denote the association or relationship between two or more variables. It measures the strength or the extent of an association between the variables, and also its direction (Gogtay & Thatte, 2017). The Pearson product-moment correlation was used to assess the relationship between the study variables: Control Environment, Control Activities, Risk Assessment, Monitoring and Credit Risk. Correlation analysis generates correlation coefficients which quantify the strength to which bivariate data is related.

The correlation coefficient 'r' ranges in value from -1 to +1. A correlation coefficient of +1 indicates that the two variables are perfectly related in a positive linear manner, a correlation coefficient of -1 indicates that the two variables are perfectly related in a negative linear manner, while a correlation coefficient of zero indicates that there is no

linear relationship between the two variables being studied. A two-tailed test was carried out at a significance level of 5%. Based on the two-tailed test, values below or equal to 0.025 were considered statistically significant.

From Table 4.44, Control Environment had an insignificant relationship with credit risk since the p-value (0.078) was greater than 0.025. Control Activities, Risk Assessment and Monitoring had p-values of 0.011,0.012 and 0.001, respectively, which were less than 0.025, depicting that there was a significant relationship with credit risk. The independent variables of the study were negatively correlated to each other, with Control Activities having correlation coefficient of -0.517, Risk Assessment with -0.763 and Monitoring with -0.635.

4.6.2 Model Summary

Multiple regression analysis was used to determine the significance of the relationship between the independent and dependent variables. R-value represents the relationship between the variables, and a value greater than 0.4 depicts a strong relationship. R-square shows the total variation for the dependent variable that could be explained by the independent variables, where a value greater than 0.5 shows that the model is effective, while adjusted R-squared shows the generalisation of the results.

The findings in Table 4.45 show that internal control systems variables explain 61.2% of the variation in credit risk in deposit-taking Saccos in Western Kenya, where $R = 0.783$, $R^2 = 0.612$, while adjusted R square is 0.583. Thirty-eight percent (38.8%) of the change in the level of credit risk in Saccos in Western Kenya is influenced by other factors not included in this study.

4.6.3 ANOVA

Analysis of Variance is used to test whether the model is significant enough to determine the outcome. A 5% significance level was chosen for the study, and the p-value should be less than 0.05 for it to be significant.

From Table 4.46, the F ratio is 3.132, which is greater than the critical value of 2.46, denoting a significant relationship between Internal Control Systems and Credit Risk in deposit-taking Saccos in Western Kenya. The F-statistic had a p-value of 0.007, which is less than 0.05, also implying significance and model fitness.

4.6.4 Multiple Regression Coefficients

Multiple Regression was conducted to establish the relationship between the variables. Regression coefficients were generated to signify how much the mean of the dependent variable varies when the independent variable is changed by one unit, while other variables in the model were held constant.

The generated regression results are as shown in Table 4.47, hence the equation (i) shown in equation 1.

The constant value 5.11 shows the value of the dependent variable when the other factors are 0. The constant of 5.11 can be interpreted to mean that without internal control

systems in place, credit risk would be at 5.11 units. A significant relationship is shown by the regression constants, as demonstrated by the p-value 0.000, which is below 0.05 at 95% confidence level. Control environment had an insignificant relationship with credit risk since its p-value (0.124) was greater than 0.05, while control activities, Risk assessment and monitoring were statistically significant with β values of -.191, -.225, and -.217, which had p-values of 0.011, 0.007 and 0.001, respectively

4.7 Discussion of Findings

4.7.1 Control Environment and Credit Risk

The null hypothesis of this objective stated that there is no significant relationship between the control environment and the credit risk of deposit-taking Saccos in Western Kenya. The findings of the regression coefficient were -0.089 with a p-value of 0.124. These findings showed that the control environment was insignificant since the p-value was above 0.05 at 5% significance level. The t-statistic of -1.621 was below the tabulated t-statistic of 1.980, implying that there was an insignificant relationship between control environment and credit risk. These findings generally depicted that there was an insignificant relationship between control environment and credit risk in deposit-taking Saccos in Western Kenya. Hence, the study fails to reject the null hypothesis that states that there is no significant relationship between control environment and credit risk.

4.7.2 Control Activities and Credit Risk

The regression coefficient of control activities, as shown in the model reveal that an increase in control activities would lead to a unit decrease in credit risk, as depicted by the coefficient -0.191. The p-value was 0.011, which is less than 0.005 at 95% confidence level, which implied significance of control activities on credit risk. These findings translate to improved financial performance in Saccos through the reduction of credit risk by reducing the number of non-performing loans. The null hypothesis stated that there was no significant relationship between control activities and credit risk in deposit-taking Saccos in Western Kenya.

The t-statistic generated was -2.274, which was greater than the computed statistic of -1.980, thus signifying that there exists a significant relationship between control activities and credit risk. This significance means that a unit increase in control activities in Saccos would reduce credit risk by -0.191. The study, therefore, rejected the null hypothesis that control activities have no significant effect on credit risk. These findings resonate with those of Katumba (2021), who sought to explore the credit risk management practices of savings and credit cooperative societies: a case of Uganda Revenue Authority Sacco. The findings revealed that following the debt collection policy, adherence to security policies in place, which include control activities are best credit risk management practice.

The constructs of the contingent theory were in agreement with the findings of this objective. This theory examines which contingency characteristics firms choose to adapt in their internal control structure and whether it results in a more favorable assessment

of the effectiveness of control by the management. Both the descriptive and inferential statistics were in line with the theory. The Saccos have adopted different credit policies and procedures which meet their objectives, such as the rates of interest on loans, types of loans, loan application procedures and credit appraisal procedures. Effective policies lead to improved organizational performance in registered deposit-taking Saccos in Western Kenya.

4.7.3 Risk Assessment and Credit Risk

The third objective of the study was to establish the influence of risk assessment on the credit risk of registered deposit-taking Saccos in Western Kenya. The null hypothesis stated that there was no significant relationship between risk assessment and credit risk. The βeta, t-statistic and p-values were -0.225, -2.531 and 0.007, respectively. The p-value was significant at 5% significance level since it was less than 0.05. The β value of -0.225 showed that a unit increase in risk assessment led to a unit decrease in credit risk by 22.5%.

The t-statistic of -2.531 was greater than the tabulated value of 1.980, which revealed that there was a significant relationship between risk assessment and credit risk. The null hypothesis was rejected since it was established that risk assessment had a significantly negative influence on credit risk in Saccos in Western Kenya. The inferential statistics were in alignment with those of the descriptive statistics, where the majority of the respondents agreed that risk mitigation techniques were in place, which in turn reduced the level of credit risk.

The elements contained in the Modern Portfolio Theory resonate with the findings of the study. The theory provides a method that can be used by risk-averse investors to construct diversified portfolios that maximize their returns without unacceptable levels of risk. Saccos have devised various ways of identifying risks, such as variance reports from external and internal audits. Saccos have incorporated various credit risk management policies by having diversified loan portfolios, which in turn credit risk associated with lending.

These findings also resonate with those of Buro (2019), who sought to establish the relationship between credit risk management and the performance of loan portfolios of deposit-taking savings and credit co-operative societies in Garissa County, Kenya. The correlation results showed that there was a significant relationship between credit risk identification and loan portfolio performance. The findings also showed that a unit increase in credit risk identification led to a 0.736-unit increase in the performance of loan portfolios among Saccos.

4.7.4 Monitoring and Credit Risk

The fourth objective of this study was based on the null hypothesis that there was no significant relationship between monitoring and credit risk. The derived t-statistic was -3.213, which was more than the tabulated t-critical value of -1.980. Therefore, there was a significant relationship between monitoring and credit risk in Saccos in Western Kenya.

The p-value of the regression coefficient was 0.001 with the β value of -0.217, which was less than 0.05, depicting significance at 95% confidence level. Therefore, the null hypothesis was rejected since monitoring had an influence on credit risk.

These inferential statistics findings were in line with the descriptive statistics, where monitoring was seen to have a major impact on credit risk. Internal and external auditing was conducted in these Saccos with frequent preparation of audit reports relating to credit risk. These results concurred with those of Agang (2020), who aimed to determine the impact of internal control systems on credit risk among commercial banks listed in Nairobi Securities Exchange, Kenya. The verdict showed that monitoring had a significant positive association with credit risk; a unit increase in monitoring would lead to a decrease in credit risk by 0.273 ($\beta 1 = 0.273$, $t = 1.916$).

Agency theory guided the findings in this study through its constructs, which entails existence of a principal-agent relationship in an organization. It involves the principal delegating some decision-making authority to the agent. The agent-principal relationship is strengthened more by the principal employing an expert and systems in the form of auditors and internal control systems to monitor the agent. This has been evidenced by the findings in the descriptive statistics, which state that Saccos have implemented an internal audit function in their organizations and frequent evaluations on the performance of individuals are done.

5. Conclusions and Recommendations

5.1 Conclusions

The following conclusions were drawn from the empirical, theoretical and statistical evidence in the study.

5.1.1 Effect of Control Environment on Credit Risk

The regression coefficients of the control environment had a β value of -0.089 with a p-value of 0.124, which was above 0.05 at 95% confidence level. The correlation coefficient r was 0.402 with a p-value of 0.078, which was above 0.025 on the constructs of the two-tailed test, depicting insignificance. The derived t-statistic was -1.621, which was below the tabulated t-statistic of -1.980, hence implying insignificance. It was therefore concluded that the control environment had an insignificant effect on credit risk in registered deposit-taking Saccos in Western Kenya.

5.1.2 Effect of Control Activities on Credit Risk

The p-value of the regression coefficient was 0.011 with a beta value of .191 which is less than 0.005 at 95% confidence level. The t-statistic was significant with a value of -2.274, which was greater than the tabulated value of -1.980, indicating that control activities have an influence on credit risk in deposit-taking Saccos in Western Kenya. Control activities in Saccos may be improved through segregation of duties, putting security measures in place to avoid access to all information by one individual, adherence to credit

policy procedures, provision of variance reports for non-performing loans, efficient credit appraisal techniques and implementing proper credit approval procedures. The study concluded that the overall relationship between control activities and credit risk was significant since a positive increase in control activities would lead to a decrease in credit risk by -2.274.

5.1.3 Effect of Risk Assessment on Credit Risk

The regression estimates of βeta, t-statistic and p-values were -0.225, -2.531 and 0.007, respectively. The t-statistic was more than the computed value of -1.980. The majority of the respondents in the Saccos agreed that risk assessment was thoroughly done and had an impact on credit risk. This suggests that when risk assessment is efficiently and effectively done, credit risk will reduce greatly and the performance of the Sacco will be boosted. Risk assessment procedures in the Saccos include: effective analysis of risk to determine priority areas, frequent preparation of credit risk assessment reports, regular evaluation of risk mitigation techniques and implementation of effective risk mitigation techniques. These findings led to the conclusion that risk assessment had a significant effect on credit risk in deposit-taking Saccos in Western Kenya.

5.1.4 Effect of Monitoring on Credit Risk

The p-value of the regression coefficient was 0.001 with the β value of -0.217, which was less than 0.05, depicting significance at 95% confidence level. The derived t-statistic was -3.213, which was more than the tabulated t-critical value of -1.980. Some of the monitoring activities which the Sacco employed were the services of the internal and external auditors, performance evaluation techniques and regular evaluation of non-performing loans. The whole process of loaning is monitored, and there is regular evaluation to ensure it is appropriate. The loaning process follows certain set rules which must be adhered to. It was concluded that the general relationship between monitoring and credit risk was found to be statistically significant. The findings also conclude that credit monitoring has led to a reduction of default risks to a large extent.

5.2 Recommendations of the Study

5.2.1 Control Environment and Its Effect on Credit Risk

From the descriptive, some of the respondents disagreed that management acts with integrity in the execution of their roles. In line with these findings, it was recommended that shareholders of the Saccos should ensure that proper vetting of members of the management team is done before their appointment. Individuals selected to hold these positions are required to be of high integrity and of good ethical conduct. They will put the interests of the members and the Sacco at large before their own personal interests. The decisions they make will not be for their personal gain but for the betterment of the Saccos. Stringent measures should be in place on how the management should conduct themselves, and in case there is a breach of any rule or proof of any malpractice, disciplinary measures should be taken.

A number of respondents were not in agreement that assignment of authority and responsibility is efficiently done by management; hence, Sacco management, in collaboration with the human resource department, should ensure that roles are assigned to the qualified persons. When roles are assigned to the right people, the output will be high, and quality work will be done. Regular training of employees will also ensure competence at work. When duties are dispensed appropriately, work will be done effectively, and the overall performance of the Sacco will improve.

5.2.2 Control Activities and Credit Risk

Both the inferential and descriptive statistics revealed that control activities had an impact on credit risk in Saccos. Some respondents disagreed that policies and procedures are adhered to in credit appraisals. It was endorsed that credit policies and procedures should be followed to the letter to ensure that loans are issued to creditworthy people and that there is security for every loan issued. This will reduce the number of bad debts incurred and influence financial performance positively.

Various respondents were of the opinion that segregation of duties was not done in their Saccos. From these results, it was recommended that the human resource management department should work towards ensuring that segregation of duties is done. Everyone must have a clear job description, and no ghost workers should be there. Every employee should have a higher authority to whom they report. In addition, authorizations should also be made by specific persons to authorized personnel only. Work should flow from one department to another, and not all be done by one department or person. This will help to identify any loopholes in case of fraudulent activities in the Sacco. Physical controls, such as safes and computer controls, such as passwords, should be in place to avoid leakage of important and confidential information.

5.2.3 Risk Assessment and Credit Risk

Concerning risk assessment and credit risk, it was evident that some Saccos did not have measures in place to identify pertinent issues relating to credit risk. In line with the findings, Saccos ought to have proper risk assessment procedures to help them identify and handle risks. The organization should set up a risk management system that will identify, reduce and eliminate risks in the Saccos. Risk mitigation can be done whereby the risk management teams train the other employees on ways of identifying risks. Risk assessment ensures that risks are dealt with on time before they worsen. Measures should be in place to identify pertinent issues relating to credit risk, which will reduce the number of loans that default.

From the descriptive statistics, it is also evident that some Saccos lack effective credit mitigation techniques to help prevent fraud and the misappropriation of funds. It was therefore recommended that authorizations of transactions and approvals should be done with the approval of the relevant parties. Cash transactions should be eliminated, and all income should be categorized onto different accounts for transparency and

accountability purposes. Furthermore, results from the inferential statistics show that Saccos must have control procedures, such as security measures, both physical and computer controls, to check for thieves and be able to track them down.

5.2.4 Monitoring and Credit Risk

From the inferential and descriptive results, it is evident that some of the audit staff are not involved in credit risk identification and mitigation measures. Following these findings, it was recommended that both the internal and external audit staff ought to execute their roles diligently to enhance transparency and accountability. The role of the auditors is vital in the management of credit risk since they understand the internal controls better and give necessary recommendations. The Saccos should comply with the given recommendations to be able to avoid risks.

It is also evident from the findings that some internal auditors do not prepare objective reports relating to credit risk. Sacco should ensure that the independence and professionalism of auditors are highly valued before appointment to avoid any conflict of interest and in order for them to give objective reports. Auditors were also expected to give feedback on their findings so that the Sacco could gauge the actual and projected performance.

Conflict of Interest Statement

The authors declare no conflicts of interest.

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Appendix A: Tables

Table 1: Reliability Test Results

Variable	Number of items	Cronbach Alpha	Conclusion
Control environment	8	0.860	Reliable
Control activities	9	0.880	Reliable
Risk assessment	10	0.865	Reliable
Monitoring	10	0.825	Reliable

Table 2: Validity Test Results

			Bartlett's test		
	No of Items	KMO	$\chi 2$	df	P-value
Control environment	8	0.656	181.662	20	0.000
Control activities	9	0.805	149.102	20	0.000
Risk assessment	10	0.511	104.692	20	0.000
Monitoring	10	0.605	140.850	20	0.000

Table 1: Assignment of Authority and Responsibility

	Frequency	Percent	Cumulative Percent
Strongly Disagree	4	3.4	3.4
Disagree	2	1.7	5.1
Neutral	12	10.2	15.3
Agree	40	33.9	49.2
Strongly Agree	60	50.8	100.0
Total	**118**	**100.0**	

Table 2: Upholding of Ethical Values by Top Management

	Frequency	Percent	Cumulative Percent
Strongly Disagree	1	.8	.8
Disagree	3	2.5	3.4
Neutral	16	13.6	16.9
Agree	52	44.1	61.0
Strongly Agree	46	39.0	100.0
Total	**118**	**100.0**	

Table 3: Level of Integrity Support Reduction of Credit Risk

	Frequency	Percent	Cumulative Percent
Strongly Disagree	2	1.7	1.7
Disagree	10	8.5	10.2
Neutral	23	19.5	29.7
Agree	33	27.9	57.6
Strongly Agree	50	42.4	100.0
Total	**118**	**100.0**	

Table 4: Management Acts with Integrity in Execution of their Roles

	Frequency	Percent	Cumulative Percent
Strongly Disagree	1	.8	.8
Disagree	24	20.4	21.2
Neutral	25	21.2	42.4
Agree	44	37.3	79.7
Strongly Agree	24	20.3	100.0
Total	**118**	**100.0**	

Table 5: Assignment of Authority and Responsibility by Management

	Frequency	Percent	Cumulative Percent
Strongly Disagree	5	4.2	4.2
Disagree	16	13.6	17.8
Neutral	30	25.4	43.2
Agree	34	28.8	72.0
Strongly Agree	33	28.0	100.0
Total	**118**	**100.0**	

Table 6: Management Decisions Uphold Ethical Values

	Frequency	Percent	Cumulative Percent
Strongly Disagree	4	3.4	3.4
Disagree	23	19.5	22.9
Neutral	28	23.7	46.6
Agree	34	28.8	75.4
Strongly Agree	29	24.6	100.0
Total	**118**	**100.0**	

Table 7: Management Has No Conflict of Interest

	Frequency	Percent	Cumulative Percent
Strongly Disagree	8	6.8	6.8
Disagree	12	10.2	16.9
Neutral	36	30.5	47.5
Agree	36	30.5	78.0
Strongly Agree	26	22.0	100.0
Total	**118**	**100.0**	

Table 8: Conflict of Interest by Top Management

	Frequency	Percent	Cumulative Percent
Strongly Disagree	4	3.4	3.4
Disagree	20	16.9	20.3
Neutral	23	19.5	39.8
Agree	27	22.9	62.7
Strongly Agree	44	37.3	100.0
Total	**118**	**100.0**	

Table 9: Segregation of Duties Reduces Default Risk

	Frequency	Percent	Cumulative Percent
Strongly Disagree	3	2.5	2.5
Disagree	8	6.8	9.3
Neutral	13	11.0	20.3
Agree	33	28.0	48.3
Strongly Agree	61	51.7	100.0
Total	**118**	**100.0**	

Table 10: Credit Policies and Procedures

	Frequency	Percent	Cumulative Percent
Strongly Disagree	4	3.4	3.4
Disagree	13	11.0	14.4
Neutral	21	17.8	32.2
Agree	46	39.0	71.2
Strongly Agree	34	28.8	100.0
Total	**118**	**100.0**	

Table 11: There is Segregation of Duties in Your Sacco

	Frequency	Percent	Cumulative Percent
Strongly Disagree	7	5.9	5.9
Disagree	16	13.6	19.5
Neutral	22	18.6	38.1
Agree	39	33.1	71.2
Strongly Agree	34	28.8	100.0
Total	**118**	**100.0**	

Table 12: Security Measures are in Place to Reduce Access of All Information

	Frequency	Percent	Cumulative Percent
Disagree	17	14.4	14.4
Neutral	26	22.0	36.4
Agree	45	38.2	74.6
Strongly Agree	30	25.4	100.0
Total	**118**	**100.0**	

Table 13: Measures are in Place to Ensure That Regulations are Adhered to

	Frequency	Percent	Cumulative Percent
Strongly Disagree	2	1.7	1.7
Disagree	12	10.2	11.9
Neutral	30	25.4	37.3
Agree	34	28.8	66.1
Strongly Agree	40	33.9	100.0
Total	**118**	**100.0**	

Table 14: Strict Adherence to Credit Policy Procedures Reduces Default Risk

	Frequency	Percent	Cumulative Percent
Strongly Disagree	2	1.7	1.7
Disagree	16	13.6	15.3
Neutral	24	20.3	35.6
Agree	47	39.8	75.4
Strongly Agree	29	24.6	100.0
Total	**118**	**100.0**	

Table 15: Restrictions to Access of All Information Enhances Reduction of Risk

	Frequency	Percent	Cumulative Percent
Strongly Disagree	2	1.7	1.7
Disagree	11	9.3	11.0
Neutral	38	32.2	43.2
Agree	39	33.1	76.3
Strongly Agree	28	23.7	100.0
Total	**118**	**100.0**	

Table 18: Variance Reports on Provision for Bad Debts Are Generated

	Frequency	Percent	Cumulative Percent
Strongly Disagree	2	1.7	1.7
Disagree	20	16.9	18.6
Neutral	32	27.2	45.8
Agree	41	34.7	80.5
Strongly Agree	23	19.5	100.0
Total	**118**	**100.0**	

Table 16: Analysis of Variance Reports Enhances Reduction of Credit Risk

	Frequency	Percent	Cumulative Percent
Strongly Disagree	4	3.4	3.4
Disagree	19	16.1	19.5
Neutral	30	25.4	44.9
Agree	26	22.0	66.9
Strongly Agree	39	33.1	100.0
Total	**118**	**100.0**	

Table 17: Pertinent Issues Relating to Credit Risk

	Frequency	Percent	Cumulative Percent
Strongly Disagree	2	1.7	1.7
Disagree	11	9.3	11.0
Neutral	7	5.9	16.9
Agree	45	38.2	55.1
Strongly Agree	53	44.9	100.0
Total	**118**	**100.0**	

Table 18: Effective Analysis of Risk Is Frequently Done

	Frequency	Percent	Cumulative Percent
Strongly Disagree	4	3.4	3.4
Disagree	8	6.8	10.2
Neutral	18	15.2	25.4
Agree	52	44.1	69.5
Strongly Agree	36	30.5	100.0
Total	**118**	**100.0**	

Table 19: There Are Effective Credit Mitigation Techniques in Your Sacco

	Frequency	Percent	Cumulative Percent
Strongly Disagree	5	4.2	4.2
Disagree	11	9.4	13.6
Neutral	15	12.7	26.3
Agree	43	36.4	62.7
Strongly Agree	44	37.3	100.0
Total	**118**	**100.0**	

Table 20: Risk Mitigation Techniques Are Frequently Evaluated for Improvement

	Frequency	Percent	Cumulative Percent
Strongly Disagree	3	2.5	2.5
Disagree	9	7.6	10.2
Neutral	38	32.2	42.4
Agree	37	31.4	73.7
Strongly Agree	31	26.3	100.0
Total	**118**	**100.0**	

Table 21: Credit Risk Assessment Reports Are Frequently Prepared

	Frequency	Percent	Cumulative Percent
Strongly Disagree	4	3.4	3.4
Disagree	17	14.4	17.8
Neutral	21	17.8	35.6
Agree	50	42.4	78.0
Strongly Agree	26	22.0	100.0
Total	**118**	**100.0**	

Table 22: Identification of Pertinent Issues

	Frequency	Percent	Cumulative Percent
Strongly Disagree	1	.8	.8
Disagree	16	13.6	14.4
Neutral	27	22.9	37.3
Agree	33	28.0	65.3
Strongly Agree	41	34.7	100.0
Total	**118**	**100.0**	

Table 23: Analysis of Risk Prone Areas Supports Reduction of Credit Risk

	Frequency	**Percent**	**Cumulative Percent**
Strongly Disagree	4	3.4	3.4
Disagree	10	8.5	11.9
Neutral	34	28.8	40.7
Agree	35	29.6	70.3
Strongly Agree	35	29.7	100.0
Total	**118**	**100.0**	

Table 24: Effective Implementation of Credit Mitigation Techniques

	Frequency	**Percent**	**Cumulative Percent**
Strongly Disagree	3	2.5	2.5
Disagree	12	10.2	12.7
Neutral	29	24.6	37.3
Agree	38	32.2	69.5
Strongly Agree	36	30.5	100.0
Total	**118**	**100.0**	

Table 25: Frequent Evaluation of Credit Mitigation Techniques

	Frequency	Percent	Cumulative Percent
Strongly Disagree	3	2.5	2.5
Disagree	18	15.3	17.8
Neutral	23	19.5	37.3
Agree	49	41.5	78.8
Strongly Agree	25	21.2	100.0
Total	**118**	**100.0**	

Table 26: Frequent Preparation of Credit Risk Reports

	Frequency	**Percent**	**Cumulative Percent**
Strongly Disagree	8	6.8	6.8
Disagree	15	12.7	19.5
Neutral	17	14.4	33.9
Agree	36	30.5	64.4
Strongly Agree	42	35.6	100.0
Total	**118**	**100.0**	

Table 27: Internal Audit Staff Are Involved in Credit Risk Identification

	Frequency	**Percent**	**Cumulative Percent**
Strongly Disagree	3	2.5	2.5
Disagree	14	11.9	14.4
Neutral	11	9.3	23.7
Agree	32	27.1	50.8
Strongly Agree	58	49.2	100.0
Total	**118**	**100.0**	

Table 28: Internal Auditors Prepare Objective Reports

	Frequency	Percent	Cumulative Percent
Strongly Disagree	6	5.1	5.1
Disagree	8	6.8	11.9
Neutral	15	12.7	24.6
Agree	61	51.7	76.3
Strongly Agree	28	23.7	100.0
Total	**118**	**100.0**	

Table 29: Internal Audit Reports on Credit Risk Are Acted Upon Promptly

	Frequency	Percent	Cumulative Percent
Strongly Disagree	4	3.4	3.4
Disagree	12	10.2	13.6
Neutral	26	22.0	35.6
Agree	38	32.2	67.8
Strongly Agree	38	32.2	100.0
Total	**118**	**100.0**	

Table 30: Performance Evaluation Is Regularly Done in Your Sacco

	Frequency	Percent	Cumulative Percent
Strongly Disagree	2	1.7	1.7
Disagree	16	13.6	15.3
Neutral	23	19.5	34.7
Agree	43	36.4	71.2
Strongly Agree	34	28.8	100.0
Total	**118**	**100.0**	

Table 31: External Audit Reports Are Acted Upon for Improvement

	Frequency	Percent	Cumulative Percent
Strongly Disagree	3	2.5	2.5
Disagree	8	6.8	9.3
Neutral	37	31.4	40.7
Agree	34	28.8	69.5
Strongly Agree	36	30.5	100.0
Total	**118**	**100.0**	

Table 32: Involvement of Internal Audit Staff in Credit Risk Identification and Mitigation

	Frequency	Percent	Cumulative Percent
Strongly Disagree	3	2.5	2.5
Disagree	16	13.6	16.1
Neutral	30	25.4	41.5
Agree	40	33.9	75.4
Strongly Agree	29	24.6	100.0
Total	**118**	**100.0**	

Table 33: Objectivity of Internal Audit Reports Helps in Curbing Default Risk

	Frequency	Percent	Cumulative Percent
Strongly Disagree	3	2.5	2.5
Disagree	14	11.9	14.4
Neutral	36	30.5	44.9
Agree	37	31.4	76.3
Strongly Agree	28	23.7	100.0
Total	**118**	**100.0**	

Table 34: Prompt Action of Internal Audit Reports Reduces Credit Risk

	Frequency	Percent	Cumulative Percent
Strongly Disagree	3	2.5	2.5
Disagree	14	11.9	14.4
Neutral	30	25.4	39.8
Agree	43	36.5	76.3
Strongly Agree	28	23.7	100.0
Total	**118**	**100.0**	

Table 35: Regular Evaluation of Non-Performing Loans

	Frequency	Percent	Cumulative Percent
Strongly Disagree	1	.8	.8
Disagree	19	16.1	16.9
Neutral	31	26.3	43.2
Agree	37	31.4	74.6
Strongly Agree	30	25.4	100.0
Total	**118**	**100.0**	

Table 36: Pro-Active Action of External Audit Reports Reduces Default Risk

	Frequency	Percent	Cumulative Percent
Strongly Disagree	3	2.5	2.5
Disagree	16	13.6	16.1
Neutral	26	22.0	38.1
Agree	37	31.4	69.5
Strongly Agree	36	30.5	100.0
Total	**118**	**100.0**	

Table 37: Normality

Variable	Shapiro-Wilk		
	W Statistic	**df**	**Sig.**
Control environment	0.923	118	0.071
Control activities	0.770	118	0.068
Risk assessment	0.786	118	0.061
Monitoring	0.872	118	0.057

Table 38: Model Auto Correlation

Durbin-Watson
1.91

Table 39: Multicollinearity Test

	Tolerance	**VIF**
Control environment	.875	1.143
Control activities	.995	1.005
Risk assessment	.839	1.191
Monitoring	.925	1.081

Table 40: Breusch Pagan Test

Model	**chi2(1)**	**Prob > chi2**
BP test	2.21	0.1326

Table 41: Correlation Analysis

Correlations						
		Control environment	**Control activities**	**Risk assessment**	**Monitoring**	**Credit risk**
Control Environment	Pearson Correlation	1				
	Sig. (2-tailed)					
Control Activities	Pearson Correlation	0.381	1			
	Sig. (2-tailed)	(0.261)				
Risk Assessment	Pearson Correlation	0.243	0.092	1		
	Sig. (2-tailed)	(0.084)	(0.522)			
Monitoring	Pearson Correlation	0.412	0.183	0.275	1	
	Sig. (2-tailed)	(0.124)	(0.266)	(0.057)		
Credit risk	Pearson Correlation	0.402	-0.517*	-0.763*	-0.635*	1
	Sig. (2-tailed)	(0.078)	(0.011)	(0.012)	(0.001)	

Table 42: Model Summary

Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.783a	.612	.583	2.149

a. Predictors: (Constant), Monitoring, Risk assessment, Control activities, Control environment
b. Dependent Variable: Credit risk

Table 43: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2.989	4	0.747	3.132	0.007[b]
Residual	26.951	113	0.2385		
Total	**29.940**	**117**			

Table 44: Regression Coefficients

Model	Unstandardized Coefficients		T	Sig.
	B	Std. Error		
(Constant)	5.110	1.321	3.867	.000
Control environment	-.089	.055	-1.621	.124
Control activities	-.191	.084	-2.274	.011
Risk assessment	-.225	.089	-2.531	.007
Monitoring	-.217	.068	-3.213	.001

Table 45: Summary of Hypothesis

Hypothesis	Estimate	P-value	Conclusion
H_{01}: Control environment has no significant influence on credit risk of registered deposit-taking Saccos in Western Kenya.	β_1 = -0.089	0.124	Fail to reject H_{01}
H_{02}: Control activities have no significant influence on credit risk of registered deposit-taking Saccos in Western Kenya.	β_2= -0.191	0.011	Reject H_{02}
H_{03}: Risk assessment has no significant influence on credit risk of registered deposit-taking Saccos in Western Kenya.	β_3 -0.225	0.007	Reject H_{03}
H_{04}: Monitoring has no significant influence on credit risk of registered deposit-taking Saccos in Western Kenya.	β_4 = -0.217	0.001	Reject H_{04}

Appendix B: Equations

$$Y = 5.11 - 0.089X_2 - 0.191X_2 - 0.225X_3 - 0.217X_4 + \varepsilon$$