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An analysis of moderating effect of investment decisions on the relationship between corporate risk management and financial performance of deposit taking savings and credit cooperative societies in western Kenya

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Abstract
Globally, the financial performance of Savings and Credit Cooperative Societies (SACCOs) has been improving steadily as shown by the increase in membership which is approximated at one billion, with the turnover from the world's 300 top SACCOs amounting to $2.5 trillion as at December 2017. In Africa, SACCOs have had a significant role in transforming the continent through financial support of businesses. They play a fundamental role in Kenya's financial sector by assisting members save money and offer credit facilities. However, statistics show that financial performance of DT-SACCOs is fluctuating as shown by non-performing loans which stood at 5.12%, 5.23% and 6.14% as at 2015, 2016 and 2017 respectively, with that of DT-SACCOs in Western Kenya averaging 6.2% for the five years. The study sought to analyse the moderating effect of investment decisions on the relationship between corporate risk management and financial performance of DT-SACCOs in Western Kenya. Secondary data from financial statements was used while key informants who were chairpersons of the DT-SACCOs provided primary data that was used for triangulation purposes. The study revealed a significant moderating effect of investment decisions on the relationship between corporate risk management and financial performance ($\Delta R^2 = .166$, $p < 0.05$), indicating that incorporating investment decisions in corporate risk management improves financial performance by 16.6%. The study concludes that investment decisions are important when considered alongside corporate risk management, and recommends that DT-SACCOs in Western Kenya ought to invest in corporate risk management constructs of credit risk and operational risk management while incorporating investment decisions.

Keywords: Savings and Credit Cooperative Societies, analyse the moderating

Introduction
Background of the Study
The financial performance of Savings and Credit Cooperative Societies (SACCOs) has been improving steadily as shown by the increase in membership which is approximated at one billion globally, with the turnover from the world's 300 top SACCOs amounting to $2.5 trillion as at December 2017. In Africa, SACCOs have had a significant role in transforming the continent through financial support of businesses. Savings and Credit Cooperative Societies (SACCOs) play a fundamental role in Kenya's financial sector through assisting members save money and advance credit to interested members. However, statistics show that non-performing loans stood at 5.12%, 5.23% and 6.14% as at 2015, 2016 and 2017 respectively which indicates fluctuating financial performance in the Deposit-taking savings and credit cooperatives Societies (DT-SACCOs) segment. Empirical evidence demonstrates credible but inconsistent relationships between corporate risk management and financial performance.

Managers desire to invest in projects that have less risk and thereby improving financial performance of a firm (Xun Li, 2009) [29]. Studies on the moderating influence of investment decisions show that investment decisions could moderate relationships. Priestley *et al.* (2008) [24] in their study on corporate governance and investment decisions and growth show significant moderating effect. Li and Tang (2010) [14] showed the moderating role of managerial discretion on CEO hubris and firm risk taking.

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Li and Zou (2014) [13] demonstrate the relationship between credit risk management and profitability of the 47 commercial banks in Europe using multivariate regression analysis. Bakaeva and Sun (2009) [3] showed that credit risk management effect on profitability was not the same in different banks sampled in Sweden. Measures of credit risk management used in the study significantly affect financial performance of commercial banks in Rwanda except risk monitoring. Credit risk identification, credit risk scoring and credit analysis and assessment significantly explain financial performance of commercial banks in Rwanda (Ugirase, 2013) [28].

Nyamwange (2010) [22] showed a positive relationship between credit risk management practices and the financial performance of SACCOs measured by ROA. Makori (2015) [18] analysed credit appraisal practices, credit monitoring, debt collection practices and credit risk governance practices have a positive effect on financial profitability of the DT SACCOs in Nairobi County.

Mutua (2016) [20] showed there was a positive relationship between credit monitoring, loan policy in mitigation of risk, loan defaulters and financial performance of SACCOs and therefore, credit risk management had a significant effect on financial performance of SACCOs.

Empirical studies that have investigated the effect of liquidity risk management on financial performance of firms include Bordeleau et al. (2010) [4], Ismal (2010), Akhtar (2011) [1], Said (2014) [26], Song'e (2015) [27] and Ogol (2011) [23] all who establish a positive effect of liquidity risk management on financial performance of firms. Konadu (2009) [15], Gwenyi et al. (2018) [10] and Mwangi (2014) [21] on the contrary established a negative effect between liquidity risk management and financial performance of firms. Bordeleau et al. (2010) [4] use of banks from a developed county indicates that the results were cautiously interpreted.

Studies conducted on the effect of operational risk on financial performance of banks include that of Francis and Hess (2014), Epetimehin and Obafemi (2015), Gikundi et al. (2014) [8] and Mathuva (2009) [19]. Whereas these studies establish a positive relationship between the variables, Gikundi et al. (2014) [8] establishes mixed results

Empirical studies have shown that investment decisions have interrelationships with other financial decisions and affects financial performance. Fazzari et al. (2000) investigated the effect of financing constraints on the investment-to-cash flow sensitivity in United States of America (US) manufacturing sector. Adelegan (2009) showed that an increase in both future profit prospects measured by Tobin's Q and cash flow result in an increase in corporate investments of firms that have low credit worthiness. The study established that the incidence and severity of information and agency problems vary across firms and over time, thereby having different effects on investment behaviour. Ariemba et al. (2016) [2] indicated that only research and development decision had a significant effect to SACCO performance while expansion decision, replacement decision, and renewal decision had none. Koroti (2014) [16] found out that investing decision positively affected financial performance, whereas there was a negative effect of financing decision on financial performance of sugar factories in Kenya. Nyale (2010),

indicated that 36% of listed companies at the NSE engaged in diversification investment decisions.

Studies that have investigated the effect of investment decisions on financial performance of finance include Fazzari et al. (2000), Adelegan (2009), Machuki (2014) [17], Koroti (2014) [16] and Nyale (2010). Of these studies, Nyale (2010) established a negative relationship between the variables while the others established a strong positive significant effect. Fazzari et al. (2000), focused on manufacturing firms in the US whose findings may not be generalised to other industries; Adelegan (2009) sampled listed firms which have different investment risk regulations unlike the DT-SACCOs and the use of questionnaires introduced biasness; Ariemba et al. (2016) [2] used descriptive research design and Machuki (2014) [17] used non-financial listed firms to establish the effect of investment decision on the performance of firms indicating that the study findings may not be applicable to SACCOs. Koroti (2014) [16] only sampled sugar firm. The study did not however employ the use of panel data indicating that the unobservable bias was not eliminated.

Methodology

Research Design: The study adopted both correlation and descriptive research designs. This type of design was deemed useful in this study because apart from just describing, survey can also be used to explain and explore the existing status of two or more variables at a given point in time.

Study Area: This area lies between latitude 2^0 North and 3^0 South, and 33^0 East and 35^0 East. The area generally lies in an altitude of 1800 meters above sea level and has agriculture as the main economic activity. According to the Kenya Housing Survey (2009), the population in the region was 9,776,913.

Target Population:The target population of this study was 19 DT-SACCOs in western region. The study was conducted on DT-SACCOs in western Kenya because, of the twelve DT-SACCOs that operated on half-year restricted licenses, which expired in June, 2017 and were thereafter renewed for another half-year to the period December 2017, six operate in Western Kenya. A DT-SACCO is given a restricted license if it has liquidity challenges, high non-performing loans ratio and if it is undercapitalized.

Sampling Technique and Sample Frame:A census was used to select all the 19 DT-SACCOs in western region. The study adopted a census approach because of the small number of DT-SACCOs in the region. A census was also used to select interviewees to assist in collection of primary data. All the chairpersons of the 19 DT-SACCOs were interviewed. The sampling technique describes the sampling unit, sampling frame, sampling procedures and the sample size for the study.

Data Collection and Data Analysis and Presentation

Hierarchical Panel data methodology was employed in this study. This is because the observations have two dimensions; cross-section and time-series. Hsiao (2005) [11] observes that panel data estimation methodology contains more degrees of freedom and less multicollinearity leading to more efficient estimates

The dependent variable is financial performance of the deposit taking SACCOs which is the ratio between net profit after tax and total assets i.e.

$$ROA = \frac{Net\ income\ after\ tax}{Total\ assets}$$

.

The independent variables in the study were:

$$Non-Performing\ Loans\ Ratio\ (NPLR) = \frac{Non-performing\ loans}{Total\ Loans}$$

,

$$Liquidity\ Asset\ Ratio\ (LAR) = \frac{Net\ current\ assets}{Total\ Assets}$$

$$Cost\ income\ Ratio\ (CIR) = \frac{Operating\ expenses}{Net\ income\ after\ tax}$$

.

The moderating variable of the study is the investment decisions which was measured by the natural logarithm of the sum invested in both financial investments and property i.e.
INVD = ln (financial investments +investment property)

Model Specification
The study adopted the model used by Fairchild and Mackinnon (2009) with some modifications. The regression analysis is mathematically presented below:

$Y_{it} = \beta_0 + \beta_1 X_i + \varepsilon_{it}$ …………………..   (1)
$Y_{it} = \beta_0 + \beta_1 X_i + \beta_2 Z_i + \varepsilon_{it}$ …………………..   (2)
$Y_{it} = \beta_0 + \beta_1 X_i + \beta_2 Z_i + \beta_3 X_i Z_i + \varepsilon_{it}$ …………………..   (3)
Source: Adopted from Fairchild and Mackinnon (2009) [7].

The following panel data regression model was mathematically tested. The regression models are modified as follows:
The first model is for the effect of corporate risk management on financial performance of deposit taking savings and credit cooperative societies in western Kenya. Where appropriate;
CRE_{it} is Credit risk management for firm i during time t
LIQ_{it} is Liquidity risk Management for firm i during time t
OPR_{it} is Operation risk Management for firm i during time t
ROA_{it} is Return on Assets for firm i during time t
$INVD_{it}$ is Investment Decision for firm i during time t
ε_{it} is the remainder disturbance term for firm i during time t.
$ROA_{it} = \beta_0 + \beta_1 CRE_{it} + \beta_2 LIQ_{it} + \beta_3 OPR_{it} + \varepsilon_{it}$…………………   (4)

Where: ROA_{it} = Financial performance of deposit taking savings and credit cooperative societies in western Kenya measured by ROA
The second model is for the effect of investment decisions on financial performance of deposit taking savings and credit cooperative societies in western Kenya.

$ROA_{it} = \beta_0 + \beta_1 INVD_{it} + \varepsilon_{it}$ …………………………   (5)

Where: ROA_{it} = Financial performance of deposit taking savings and credit cooperative societies in western Kenya.
The moderation model tests whether the prediction of a dependent variable from an independent variable differs across levels of a third variable, Z. Moderation variables affect the strength and/or the direction of the relation between a predictor and an outcome; enhancing, reducing or changing the influence of the predictor. To establish the moderating effect of investment decisions on the relationship between corporate risk management and financial performance of deposit taking savings and credit cooperative societies in western Kenya, model 3 introduces investment decision in order to establish its contribution in the general financial performance in model 1.

$ROA_{it} = \beta_0 + \beta_1 CRE_{it} + \beta_2 LIQ_{it} + \beta_3 OPR_{it} + \beta_4\ INVD_{it} + \varepsilon_{it}$
…………..   (6)

Model 4 encompasses corporate risk management constructs, financial performance, investment decision and the cross-product interaction term of corporate risk management constructs and investment decision.

$ROA_{it} = \beta_0 + \beta_1 CRE_{it} + \beta_2 LIQ_{it} + \beta_3 OPR_{it} + \beta_4 INVD_{it} + \beta_5 CRE*INDVD_{it} + \beta_6 LIQ*INDVD_{it} + \beta_7 OPR*INDVD_{it} + \varepsilon_{it}$
…………………………………   (7)
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Results and Discussion
Descriptive statistics for financial performance (ROA), Corporate risk management and Investment decisions.

Table 1: Summary of the Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
ROA	95	0.0237	0.0205	0.0201	0.0287	0.052	2.226
NPLR	95	0.062	0.014	0.030	0.279	3.646	18.380
LAR	95	0.1330	0.0124	0.099	0.14	-1.102	3.798
CIR	95	0.6579	0.0179	0.6120	0.6856	-0.725	3.038
LN-INVD	95	17.289	0.647	15.854	21.563	3.168	21.903

The results in Table 1 revealed that the mean financial performance measured by Return on Assets (ROA) for the 19 deposit taking SACCOs in western region was 2.37%. This means that the net income for the average DT-SACCO in Western Kenya is two percent of total assets.
The minimum reported Return on Assets was 2.01% while the maximum was 2.87%. The Return on Assets was spread within a standard deviation of 0.0205 implying that there was a narrow deviation of the Return on Assets from the mean as a measure of financial performance.
Likewise, the mean credit risk management measured by non-performing loan ratio was 6.2%. This implies that the non-performing loans were on average 6.2% of the total loans in the DT-SACCOs. This is far much higher than the ratio recommended by World Council of Credit Unions of 5% indicating that the DT-SACCOs are performing poorly. The minimum reported Non-Performing loan ratio was 3.0% while the maximum was 29.7%. The Non-Performing loan ratio was spread within a standard deviation of 0.014 from the mean Non-Performing loan ratio as a measure of credit risk management.
Liquidity risk management was measured by the ratio between liquid assets and total assets. The mean for liquidity was 13.3% implying that liquid assets form 13.3% of the total assets. The minimum reported Liquidity asset ratio was 9.9% while the maximum was 14%. The Liquidity

asset ratio was spread from the mean Liquidity asset ratio within a standard deviation of 0.0124. The reported liquidity asset ratio is lower than the recommended 15% by SASRA (SASRA, 2017). This shows that DT-SACCOs in Western Kenya are exposed to liquidity risk which may affect their daily operations such as lending. According to Ismal (2010), liquidity risk in DT-SACCOs is defined as the risk of being unable either to meet their obligations to depositors or to fund increases in assets as they fall due without incurring unacceptable costs or losses. Operational risk management was measured by the cost income ratio. The mean for Cost income ratio was 65.79% indicating that operational cost constitutes 65.79% of net income. The minimum reported cost income ratio was 61.20% while the maximum was 68.56%. The Cost income ratio was spread from the mean cost income ratio within a standard deviation of 0.0179.According to SASRA (2017), a SACCO should have a maximum cost income ratio of 60%. This shows that DT-SACCOs in Western Kenya are performing below the expected performance.

Correlation Analysis
Before establishing regression between the variables, a correlation was run. According to Field (2000) correlation measures the strength and direction between variables. The correlation matrix in Table 2 shows the correlation between the variables.

Table 2: Correlation between Corporate Risk Management and Financial Performance

Variables	ROA	NPLR	LAR	CIR	LN_INVD
ROA	1				
Sig. (2-tailed)	-----				
NPLR	-0.482	1			
Sig. (2-tailed)	0.000	-----			
LAR	-0.029	-0.225	1		
Sig. (2-tailed)	0.783	0.029	-----		
CIR	-0.499	0.322	0.442	1	
Sig. (2-tailed)	0.000	0.002	0.000	-----	
LN_INVD	-0.131	-0.045	0.461	0.449	1
Sig. (2-tailed)	0.206	0.668	0.000	0.000	-----

Note: ROA - Return on Assets, NPLR-Non-Performing Loan Ratio, LAR - Liquidity Asset Ratio, INVD - Investment Decisions and CIR - Cost Income Ratio

The results in the Table 4.7 revealed that there was a negative and significant association between credit risk management as measured by non-performing loan ratio and financial performance measured by Return on Assets of deposit taking savings and credit cooperative societies ($R = -0.482$, $p = 0.000$). This implies that a unit increase in nonperforming loan ratio leads to a decrease in return on asset ratio of 48.2%. This is consistent with findings by Li and Zou (2014), Bakaeva and Sun (2009) [3], Ugirase (2013) [28], Nyamwange (2010) [22], Makori (2015) [18] and Mutua (2016) [20] who reported a positive association between credit risk management and financial performance in their empirical studies. The reported findings however contradict those by Ikua (2015) [12] who established a negative association between the variables.

It is further shown that operational risk management measured by cost income ratio (CIR) and financial performance of deposit taking savings and credit cooperative societies have a negative and significant relationship with each other ($R = -0.499$, $p = 0.000$). This implies that a unit increase in cost income ratio leads to a 49.9% drop in financial performance in the DT-SACCOs. This result is in tandem with results by Francis and Hess (2014), Epetimehin and Obafemi (2015), Gikundi *et al.* (2014) [8] and Mathuva (2009) [19] which established a positive relationship between the variables. Elsewhere, the results contradict those by Gikundi *et al.* (2014) [8] established no relationship between operational risk management and financial performance commercial banks profitability in Kakamega Towns using a descriptive approach.

The findings in Table 4.7 further indicate that there is a negative but an insignificant association between liquidity risk management as measured by liquidity asset ratio (LAR) and financial performance of deposit taking savings and credit cooperative societies in western Kenya ($R = -0.029$, $p = 0.783$). This implies that there is no significant association between the management of liquidity risk and return on assets in the DT-SACCOs. The results contradict results by Bordeleau *et al.* (2010) [4], Ismal (2010), Akhtar (2011) [1], Said (2014) [26], Song'e (2015) [27] and Ogol (2011) [23] all who establish a positive relationship between liquidity risk management on financial performance of firms. Moreover, they contradict results by Konadu (2009) [15], Gwenyi *et al.* (2018) [10] and Mwangi (2014) [21] who on the contrary established a negative effect between liquidity risk management and financial performance of firms.

Table 3: Effect of Corporate Risk Management and Investment Decision on Financial Performance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Liquidity asset ratio (LAR)	0.0148	0.0177	0.8344	0.4062
Cost income ratio (CIR)	-0.0503	0.0128	-3.9289	0.0002
Non-Performing loan ratio (NPLR)	-0.4120	0.1430	-2.8810	0.0017
Investment decisions (LN_INVD).	0.0037	0.0316	0.1166	0.9075
C(Constant)	5.5269	0.7223	7.6516	0.0000
R-squared	0.3782	Mean dependent var		2.3758
Adjusted R-squared	0.3575	S.D. dependent var		0.2052
S.E. of regression	0.1665	Akaike info criterion		-0.6961
Sum squared resid	2.4958	Schwarz criterion		-0.5617
Log likelihood	38.0664	Hannan-Quinn criter.		-0.6418
F-statistic	13.1826	Durbin-Watson stat		0.5221
Prob(F-statistic)	0.0000			

Dependent Variable: ROA
Total panel (balanced) observations: 95

Note: ROA - return on assets, NPLR-non-performing loan ratio, LAR - liquidity asset ratio, INVD - Investment decisions and CIR - cost income ratio

After introducing investment decision into model one, adjusted R-squared changes to 0.3575 from 0.3486, an increase of 0.0089. This implies that including investment decision in the model improves it by about 0.89%.

The next step involved introducing investment decision as a cross-product interaction term and below was the model substituted with coefficients from table 4.11;

ROA = 2.6892 -0.2338CRE + 0.0449LIQ - 0.0358OPR + 0.0782INVD+ 0.0621CRE*INDVD -0.5596LIQ*INDVD + 0.1235OPR*INDVD

The results for the multiple regression analysis of the moderating effect of investment decisions on the relationship between corporate risk management and financial performance is shown in table 4

Table 4: Moderating Effect of Investment Decisions on the Relationship between Corporate Risk Management and Financial Performance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Liquidity asset ratio (LAR)	0.0449	0.0158	2.8431	0.0056
Cost income ratio (CIR)	-0.0358	0.0143	-2.4997	0.0143
Non-Performing loan ratio (NPLR)	-0.2338	0.1267	-1.8453	0.0684
Investment decisions (LN_INVD).	0.0782	0.0244	3.2007	0.0019
LN_INVD*CIR	0.1235	0.0484	2.5510	0.0125
LN_INVD* LAR	-0.5596	0.1145	-4.8883	0.0000
LN_INVD*NPLR	0.0621	0.0677	0.9172	0.3616
C	2.6892	0.7947	3.3841	0.0011
R-squared	0.5590	Mean dependent var		2.3758
Adjusted R-squared	0.5235	S.D. dependent var		0.2052
S.E. of regression	0.1416	Akaike info criterion		-0.9905
Sum squared resid.	1.7455	Schwarz criterion		-0.7755
Log likelihood	55.0504	Hannan-Quinn criter.		-0.9036
F-statistic	15.7540	Durbin-Watson stat		0.7819
Prob(F-statistic)	0.0000			

Dependent Variable: ROA

Total panel (balanced) observations: 95

Note: ROA - return on assets, NPLR-non-performing loan ratio, LAR - liquidity asset ratio, INVD - Investment decisions and CIR - cost income ratio, ln_invd*cir , ln_invd* lar, ln_invd*nplr

After cross-interacting investment decision with corporate risk management constructs, the model adjusted R- squared in Table 4.11 increased to 52.35% from 35.75%. This implies that the goodness of fit of the model explains 52.35% of the variation in the financial performance of deposit taking savings and credit cooperative societies in western Kenya. This shows that investment decision is a significant positive moderator on the relationship between corporate risk management and financial performance of the DT-SACCOs in Western Kenya. This further shows that introducing investment decision in the model explains 16.6% of financial performance.

Results in Table 5 indicate can be explained that corporate risk management decisions should be evaluated alongside investment decisions in order to improve financial performance.

Table 5: Before and after Moderation

	Before Moderation	After Moderation
R squared	0.3782	0.5590
Adjusted R-squared	0.3575	0.5235
P – Value	0.0000	0.0000
F – Statistics	13.1826	15.7540

The adjusted R squared before moderation was 0.3575 while the regression model was significant (P = 0.0010). This implies that the adjusted R-squared improved to 0.5235 (*p*=0.000) after moderation with investment decisions. This is an indication that there is a significant moderation effect of the investment decisions on the relationship between corporate risk management and financial performance; therefore, the null hypothesis that investment decisions do not have a moderating effect on the corporate risk management and financial performance of deposit taking SACCOs in Western Kenya was rejected and the alternate hypothesis accepted. The acceptance/rejection criteria was that, if the p value is greater than 0.05, the Ho3 is not rejected but if it's less than 0.05, the *Ho3* is rejected. The results in Table 4.10 shows that there was a statistically significant moderating influence (*p*=0.000) of investment decisions after interacting investment decisions with liquidity asset ratio (LAR) and cost income ratio (CIR) (*p*=0.000; *p*=0.0125 respectively). However, there was a statistically insignificant moderating influence (*p*=0.3616) of investment decisions after interacting investment decisions with non-performing loan ratio (NPLR).

In addition, after moderation the adjusted R squared improved from significantly 0.3575 (*p*=0.0010) to 0.5235 (*p*=0.000) after moderation with investment decisions This indicates that there is a significant moderating effect of the investment decisions on the overall model.

The moderation result in this study are in tandem with those by Priestley *et al.* (2008) [24] who using a broad sample of US manufacturing firms and Li and Tang (2010) [14] who examined the moderating role of managerial discretion on CEO hubris and firm risk taking showed that there is a significant moderating effect between variables. The results therefore are consistent with Agency theory. The result however contradicts those by Joshi and Stump (2009) who while studying the moderating role of reciprocal asset

investments on joint action in manufacturer-supplier relationships show that the moderating effect of reciprocal asset investments was not significant.

Conclusions and Recommendations

There is a positive significant variation in the relationship between corporate risk management and financial performance due to moderation indicating that whenever firms invested in investment decisions there was a moderate improvement in the relationship between corporate risk management and financial performance.

Investment decisions influence the relationship between corporate risk management and financial performance significantly; the study recommends that deposit taking SACCOs in Western Kenya should incorporate investment decisions and corporate risk management since this combination improves financial performance.

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