Research in Business & Science

Effect of liquidity risk on the financial performance of deposit taking savings and credit cooperative organisations (SACCOs) in Kenya

🆔*Benjamin Elijah Otwoko*[(a)*] 🆔*Kimani Maina* [(b)]

[(a)] *School of Business and Economics, Jomo Kenyatta University of Science and Technology, Juja Kwale, Rd, Juja, Nairobi, Kenya*

A R T I C L E   I N F O

A B S T R A C T

Liquidity risk is the potential that an entity will be unable to acquire the cash required to meet its short and intermediate-term obligations. Deposit-taking Savings and Credit Cooperative Organisation (SACCOs) face liquidity risk when they are unable to fund their operations and lending requirements to their members as and when circumstances demand. Given that liquidity is a key phenomenon on the optimal functioning and financial performance of deposit-taking SACCOs, this study critically analyzed the effect of liquidity risk on the financial performance of DT SACCOs in Kenya. The study used a descriptive survey design and employed regression methods to model the relationship between liquidity risk and financial performance of DT SACCOs. The data were analyzed at a 5% level of significance. The study findings revealed that at a 5% level of significance, liquidity risk had a statistically significant influence on the financial performance of deposit-taking SACCOs. Basing on the findings, DT SACCOs are encouraged to focus on enhancing the mobilization of deposits to ensure that an asset portfolio that minimizes liquidity risk is maintained.

Introduction

Deposit taking SACCOs pool financial resources from members and issue the same to them as loans at lower rate of interest. SACCOs must maintain optimum liquidity for both operations and members loan demand. Majority of DTS are reeling under weight of financial mismanagement, failure by employers to remit deductions, fraud and bad loans. Perennial failure by various employer-institutions to remit deductions made from employees' emoluments has adversely affected liquidity of SACCOs. Sacco Societies Regulatory Authority (SASRA) statistics showed that by the end of 2018, employers in public and private sector in Kenya owed DTS 26.7 million dollars in unremitted deductions. Inability to service members loan application as and when they fall due and failure to take advantage of good investment opportunities exposes the deposit taking SACCO to liquidity risk. The deposit taking SACCOs resort to external funding when they are unable to meet their immediate cash requirements. The deposit taking SACCOs facing financial distress borrow at unfavourable rate of interest, experience decrease in membership and decline in profitability.

Liquidity risk is the potential that an entity will be unable to acquire the cash required to meet short or intermediate term obligations (Marozva, 2015). Liquidity in deposit taking SACCOs is considered as the ability to meet financial obligations as they fall due. In deposit taking SACCOs, liquidity demands that there should be not only adequate cash-flows to make payments, but there should be enough cash to enable recurrent operations (Song'e, 2015). The degree to which DTS are exposed to liquidity risk varies across SACCOs in the industry (Getachew, 2017). Liquidity risk tends to increase with the size and sophistication of the operations of a DTS. Large SACCOs establish the Asset/Liability committee to proactively manage their assets and liabilities. As a minimum, SACCOs with total assets exceeding ten billion should establish Asset/Liability committee.

A deposit taking SACCO with higher liquidity faces lower liquidity risk hence is likely to be associated with lower borrowing costs. SACCOs with high liquidity risk tend to borrow emergency funds at high costs (Ochanda, 2018). SACCOs use a variety of ratios to measure liquidity position and trend. The ratios are classified into asset-based ratios (Cash Position Indicator, Capacity Ratio), liability-based liquidity measures (Total deposit ratio, purchased funds ratio, Core deposit ratio), and combined asset-liability

liquidity ratios (Loan to deposit ratio, Net non-core funding dependence ratio) (Sacco Societies Regulatory Authority, 2015). The cash position indicator compares vault cash and demand deposits at other financial institutions to the total asset base of the institution (Olagunju *et al.*, 2012). With a measurement range from 0 to 1, the higher the ratio the better the liquidity to fund immediate cash needs.

According to Sacco Societies Regulatory Authority (2012), for capacity ratio with a measurement range of between 0 and 1, the higher the ratio the stronger the SACCO's ability to meet immediate cash needs. Deposit taking SACCO easily raise debt from commercial lenders when most of its business is not financed with short-term commercial borrowings (purchased funds). Kimathi (2015) observed that a deposit taking SACCO should ideally rely on a large and diversified retail deposit base, which would be indicated by a high total deposit ratio. According to Sacco Societies Regulatory Authority (2015), the higher the total deposit ratio, the lower the perceived liquidity risk is because contrary to purchased funds, retail deposits are less sensitive to a change in interest rates or a minor deterioration in business performance. While deposits are the primary source of funding for DTS, loans are presumed to be the least liquid assets. A high loan to deposit ratio indicates illiquidity, because in this case a deposit taking SACCO is considered fully loaned-up relative to its stable funding (Njeri, 2017). This implies that new loans must be financed with large purchased liabilities. A low ratio suggests that a deposit taking SACCO has additional liquidity, because it can grant new loans financed with stable deposits. A deposit taking SACCO institution should ideally rely on a large and diversified retail deposit base, whose indicator would be a high total deposit ratio. The higher the total deposit ratio, the lower the perceived liquidity risk is because contrary to purchased funds, retail deposits are less sensitive to a change in interest rates or a dismal deterioration in business performance (Authority, 2015). As argued by King (2013), a higher level of liquid assets would decrease net interest margins. Liquidity risk in SACCOs in this study will be measured by loans to deposits ratio, total members' deposits to total assets ratio, cash position indicator and capacity ratio.

Economic crises in SACCOs arising from financial mismanagement have revealed the importance of regulations to hedge against the high risk attributed to imbalances in SACCOs' balance sheets. The government of Kenya has established the SACCOs Societies Regulatory Authority (SASRA) under the Ministry of Cooperative Development and Marketing to streamline, reform and regulate the SACCO subsector (Gweyi & Karanja, 2014). The powers to regulate the deposit taking Sacco Societies in Kenya are derived from the Sacco Societies Act 2008 and the regulation*s* issued therein (Njenga, Kiragu & Opiyo, 2015). According to Feisal & Masinde, (2015), the establishment of SACCO Societies Act 2008 has placed the licensing, supervision and regulation of deposit taking under the armpit of SASRA. Through this new legal framework, prudential regulations have been introduced to guide SACCO's growth and development.

The regulations are meant to improve the competitiveness of SACCOs by setting financial and operating standards (Kivuvo & Olweny, 2014). Deposit taking SACCOs are expected to comply with the core capital requirement of a minimum of KES. 10 Million, core capital to total assets of 10% and core capital to total deposits of 8 %. Although liquidity risk is an important parameter in influencing the cost of funds and consequently in determining interest income in DTS, this phenomenon has not been researched on by many scholars. In this regard, the study hypothesized that liquidity risk has a significant effect on financial performance of DTS. This research finding can therefore inform DTS policies on regulations and strategies to maximize profit margins.

This article is organized in terms of the abstract that gives the summary, introduction that introduces the major concepts on DTS liquidity risk and financial performance, the literature review in terms of the theory considered and related empirical studies, the methodology, findings, implication and conclusions.

Literature Review

Theoretical Review

Baumol's transaction demand for money model

According to Baumol's transaction demand for money model developed by Baumol and Tobin in 1952, resources invested in one sector could be withdrawn from that sector and invested elsewhere to yield either a higher or lower rate of return (Holburn & Zelner, 2010). The model shows that there is a transaction need for money to smooth out the difference between income and expenditure streams, and that the higher the interest rate on holding bonds instead of money, the smaller the transactions demand balances should be. Baumol and Tobin (1952) recognized that transactions demand for money is sensitive to rate of interest (Laina, 2018). On recognition that the discount rate performs the function of allocating resources between the private and the public sectors, a discount rate that properly indicate when resources should be transferred from one sector to another should be chosen. The model predicts that the demand for money will increase in less than proportion to the volume of transactions, that there are economies of scale in money holding for the individual (Gao, Harford & Li, 2013). Baumol model assumed that the firm is able to forecast its cash requirements with certainty and receive a specific amount at regular intervals.

In view of the desire of SACCOs to have both liquidity and reasonable return, they strike a balance between them and hold a mixed and balanced portfolio consisting of money and risky assets such as bonds and shares though this balance or mix varies between various SACCOs depending on their attitude towards risk and hence their trade-off between risk and return. According to Nyanamba *et al.*, (2013), the model implies that SACCOs should strive to maintain a target liquidity that optimizes trade-off between risk and

return. The Baumol model has been criticized on its assumption that there exists a constant disbursement rate; in reality cash outflows occur at different times.

Empirical Review

A number of empirical studies have established the relationship between liquidity risk and financial performance. Shen Chung-Hua (2009) investigated the relationship between bank liquidity risk and performance in Taiwan. The study investigated the causes of liquidity risk in commercial banks using an unbalanced panel dataset of 12 advanced economies. Panel data instrumental variables regression, using two-stage least squares estimators were used to estimate bank liquidity risk and performance model. Liquidity risk was found to be the endogenous determinant of bank performance. It was found that liquidity risk may lower bank profitability because of higher cost of funds but increase bank's net interest margins. The results of the study established that liquidity risk was negatively related to bank performance in market-based financial system. However, it had no effect on bank performance in bank-based financial system. Similarly, Shah, Khan and Tahir (2018) investigated factors that affect banks operating in Pakistan between 2007 and 2016. The study revealed that internal factors such as capital adequacy ratio, cost of funds and bank size were statistically significant but differently related to the liquidity assets to total assets ratio and to the total loans to deposits ratio respectively. The study found that external or macro factors like GDP statistically significant but affect liquidity of the banks differently. The study further revealed that profitability is insignificantly related to liquidity. After the large-scale growth since 2008, Khan and Sattar (2014) observed that the banking sector of Pakistan encountered certain level of pressures like liquidity and solvency problems which exerted significant impact on the performance of banking sector and financial system.

In Uganda, Muheebwa (2018) established the relationship between liquidity and financial performance of savings and credit cooperatives in Fort Portal. The study guided by the modern portfolio theory used correlational research design on a target population of 135 SACCOs. Stratified and simple random sampling techniques were used to obtain a sample of 19 SACCOs. The questionnaires and analysis guide were used to collect data in the study. The data collected was analyzed using both descriptive and inferential statistics. The results showed that there was a significant relationship between liquidity of portfolio and financial performance of SACCOs in Fort Portal, Uganda. The study concluded that liquidity not only helps the SACCOs to ensure that the business always has a reliable cash supply, but is also a powerful tool in determining the financial health of future investments. Marozva (2015) investigated the effect of liquidity on bank performance in South Africa for the period between 1998 and 2014. The study used autoregressive distributed lag bound testing approach and the ordinary least square methods to examine the nexus between net interest margin and liquidity. The study established that there was negative significant deterministic relationship between net interest margin and liquidity risk.

Gweyi, Olweny and Oloko (2018) determined the influence of liquidity risk on financial performance of deposit taking SACCOs in Kenya using descriptive research design. The study targeted 164 deposit taking SACCOs licensed to undertake deposit-taking SACCO business in Kenya. The census study was done and secondary data collected from 135 deposit taking SACCOs' audited financial statements. The data was analyzed using both descriptive and inferential statistics. The results of the study indicated that liquidity risk had negative and significant influence on financial performance. The recommendations of the study was that deposit taking SACCOs should manage liquidity risk by reinforcing its own resources since depositors could at any time and under unexpected reasons, withdraw their deposits to seek elsewhere investment with higher returns.

Makaa and Ondigo (2013) in their research sought to establish the relationship between liquidity risk and financial performance of commercial banks in Kenya. The study adopted correlation research design using secondary data from the balance sheets, income statements and notes of 33 Kenyan banks during 2008-2012. Multiple regression was applied to assess the impact of liquidity risk on banks' profitability. The study found that profitability of the commercial banks in Kenya was negatively affected by increase in liquidity gap and leverage. It was observed that with significant liquidity gap, banks may have to borrow from the repo market even at a higher rate thereby pushing up the cost of funds.

Muriithi and Waweru (2017) used quantitative research design to examine the effect of liquidity risk on financial performance of 43 registered commercial banks in Kenya for the period 2005 and 2014. The secondary data was collected from commercial banks' financial statements filed with the Central Bank of Kenya. The liquidity risk was measured by liquidity coverage ratio and net stable funding ratio while financial performance was evaluated by return on equity. Panel data techniques of random effects estimation and generalized method of moments were used to purge time-invariant unobserved firm specific effects and to mitigate potential endogeneity problems. Pair wise correlations between the variables were carried out. Wald and F-tests were used to determine the significance of the regression while the coefficient of determination was used to determine how variation in dependent variable is explained by independent variables. The study considered liquidity risk in terms of liquidity gap which is the difference between assets and liabilities of the bank. Liquidity risk according to the study arises due to liquidity mismatch which is measured in terms of liquidity gap. The study found that liquidity risk had a negative effect on financial performance. The study recommended that the banks' management should pay appropriate attention to liquidity management. While liquidity gap could be one of liquidity risk parameters, the study failed to measure loans to deposits ratio which is a significant ratio in evaluating the banks' position with regard to taking risk. The study also posted contradictory data (43 & 42 respectively) in the abstract, methodology and the literature review on the number of commercial banks in Kenya for the year 2005 to 2014.

Kamau and Njeru (2013) carried out a study on effect of liquidity risk on financial performance of listed insurance companies in Kenya using descriptive research design. The target population was six listed insurance companies for the period 2012-2015. A comparison of performance indicators observed in the financial statements of these companies over those years found out that operational, market and credit risks had negative effect on the financial performance of these companies. The study recommended that measures should be put into place to hedge against these risks and hence maintains a healthy financial performance. A positive relationship between liquidity risk and financial performance was however observed in some studies.
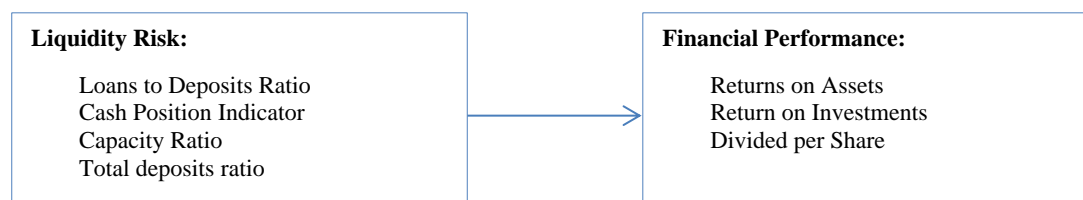
Song'e (2015) conducted a study on the effect of liquidity management on the financial performance of a sample of 27 deposit taking SACCOs licensed by SASRA in Nairobi County. Secondary data was collected from published financial statements for period between 2010 to 2014. The study found that financial performance as measured by profit before tax over total assets was positively related to liquidity risk management, operational efficiency, quick ratio and log of total assets. Njeri (2014) carried a study on the effects of liquidity on financial performance of deposit taking microfinance institutions in Kenya for the period 2009 to 2013. The data was extracted from the published annual audited reports, association of micro finance institutions reports and CBK's supervision annual reports for the five years under study. It was found that there was a positive relationship between liquidity risk and financial performance.

Key Gaps

Empirical studies of some scholars (Khan & Syed ,2013; Makaa & Ondigo 2013; Muriithi & Waweru 2017 and Kamau & Njeru 2013) failed to state whether the financial statements they used for the secondary data had been audited, thus compromising the reliability of the data. Further, some studies investigated the influence of liquidity on financial performance while others examined the influence of liquidity risk on the financial performance hence the findings were not consistent because some reported negative associations while others positive nexus between liquidity risk and financial performance. Moreover, some studies conducted in another jurisdiction which presents a contextual gap since DT SACCOs in Kenya operate under different economic conditions to that of other countries such as Ghana or Uganda. Additionally, the studies used different measures of liquidity risks and financial performance. This study used loans to deposits ratio as the proxy measure of liquidity risk and Return on Assets as the proxy measure of financial performance.

Conceptual Framework

A concept is a set of principles and ideas from a relevant field of study that aid the researcher develop and understand the situation under study (Ngumi, 2014). A conceptual framework therefore offers a logical structure of connected concepts that help provide a picture or visual display of how ideas in a study relate to one another within the theoretical framework as presented in Figure 1**.**

Liquidity Risk:	Financial Performance:
Loans to Deposits Ratio Cash Position Indicator Capacity Ratio Total deposits ratio	Returns on Assets Return on Investments Divided per Share

Figure 1: Conceptual Framework

As shown in Figure 1, the independent variable is liquidity risk and its indicators are loan to deposits ratio, cash position indicator, capacity ratio and total deposits ratio. However, for the purpose of this study, loans to deposits ratio was used as the proxy measure for liquidity risk. If the ratio is too high, it means that the bank may not have enough liquidity to cover any unforeseen fund requirements. The dependent variable is the financial performance with returns on assets, returns on investments and divided per share as the indicators. However, this study used returns on assets as the measure of DT SACCO financial performance.

Research and Methodology

The study used descriptive survey research design because it provides a knowledge base when little is known about a phenomenon. Sekaran and Bougie (2011) averred that descriptive research design helps in understanding the characteristics of a group in a given situation, assists in systematic thinking about aspects in a given situation, offers idea for further probe and helps in making certain simple decisions. Due to epistemological stance of finance studies, this study heavily relied on secondary data but also used primary data to ensure comprehensive understanding of the study problem. A longitudinal methodology covering the data of DT-Saccos from 2013 to 2016 was adopted.

96 DTS were selected from 176 DTS using Krejcie and Morgan formula.

$$S = \frac{X^2 NP (1-P)}{d^2 (N-1) + x^2(1-P)} \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (1)$$

Where S is the desired sample size

X^2 is the table value of chi-square for one degree of freedom at desired confidence level which is 1.96x 1.96= 3.841. N is the population size while P is the population proportion assumed to be 0.5 as this will provide maximum sample size and d is the degree of accuracy expressed as a proportion 0.05. The population size for this study was 176 DTS. The sample size S, was therefore:

$$S = \frac{3.8416 \text{ X } 176 \text{ X } 0.5 \,(1 - 0.5)}{0.05^2 \,(176 - 1) + 3.8416 \text{ X } 0.5(1 - 0.5)} = 96$$

However, the response rate was 77.08%, which represents 74 DTS that provided the full required data for the analysis required in this study.

Inferential methods employed were panel regression analysis and Pearson Product Moment Correlation. The following equation shows the model used in the study.

Y = β₀ + β₁X₁ᵢₜ + ε …………………………… ………………………………………………………………………………………(2)

Where **Y** represents the financial performance of the deposit taking SACCOs, while **β₁** represents beta coefficients of liquidity risk, while **β₀** is Y-intercept or constant term. **X₁** liquidity risk respectively and **ε** is the error term which accounts for all other factors outside the regression equation which did not affect the dependent variable and ᵢₜ represents time and entity in panel regression.

All data collected was analyzed at 5% level of significance. Primary data was collected from the sampled 223 DT SACCOs managers out of the total target population of 528 managers. The data was collected using questionnaires and the data analysed quantitatively using percentages, mean and standard deviations.

Empirical Data and Analysis

Descriptive Statistics

The items in the questionnaire were designed to capture the perceptions of the respondents on whether liquidity risk affected the financial performance of SACCOs. The summary of results was presented in the Table 1.

Table 1: Responses on Liquidity Risk

Statement	SA %	A%	N%	D%	SD%	Mean	Std
The SACCO maintains adequate cash to meet immediate cash demands of members.	39.80	29.80	29.30	1.10	0.00	4.08	0.86
Total SACCO's assets are adequately covered by member's deposits.	27.10	27.60	22.70	22.70	0.00	3.59	1.11
The SACCO's deposits adequately cover loan demands of the members.	24.90	22.70	28.20	23.80	0.60	3.48	1.12
Aggregate						3.71	

Valid N=181, SD=Strongly Disagree D=Disagree N=Neutral A=Agree SA= Strongly Agree Std= Standard Deviation.

The results from the Table 1 revealed that 69.6% of the respondents agreed with the statement that the deposit taking SACCOs maintain adequate cash to meet immediate cash demands of members (Mean = 4.08, Std = 0.86). The respondents who disagreed were 1.1% while 29.3% were neutral. The high number of respondents agreed with the assertion of the statement because most DT SACCOs were able to promptly service the members loans and pay dividends from profits. The results were consistent with those of Song'e (2015) who conducted a study on the effect of liquidity management on the financial performance of a sample of 27 deposit taking SACCOs licensed by SASRA in Nairobi County where it was found that financial performance as measured by profit before tax over total assets was positively related to liquidity risk, operational efficiency, quick ratio and log of total assets.

The respondents in the study who agreed that the SACCO's assets were adequately covered by member's deposits were 54.7%, while 22.7% disagreed (Mean =3.59, Std = 1.11). The percentage of the respondents who were neutral were 22.7%. Additionally, the results revealed that 47.6% of the respondents agreed that the DT-SACCOs' deposits adequately cover loan demands of the members (Mean = 3.48, Std = 1.12). However, 28.20% were not sure whether the DT- SACCOs' deposits adequately cover loan demands. However, mean of 3.48 showed that majority of respondents agreed which implied that the DT-SACCOs' deposits adequately covered loan demands of the members. This was consistent with the results of DT SACCOs' source of capital where the majority of the respondents indicated that members were the main source of funding for deposit taking SACCOs. The findings also support regulatory requirements for DT SACCOs which require that they comply with SASRA periodic returns and reports for off-site surveillance.

The study was consistent with that of Muheebwa (2018) in Uganda, who established the relationship between liquidity and financial performance of savings and credit cooperatives in Fort Portal and found that there was a significant relationship between liquidity of portfolio and financial performance of SACCOs in Fort Portal, Uganda. The statements used to measure SACCO's ability to manage

liquidity risk range from 3.48 to 4.08 with an aggregate of 3.71. This showed that majority of the respondents agreed with the statements regarding liquidity risk and the financial performance of SACCOs. According to the responses received, liquidity risk has an influence on deposit taking SACCOs' financial performance since a deposit taking SACCOs with optimal cash holding, good asset base and large volume of deposits are able to borrow on comparatively competitive terms. The standard deviation of the items indicated that the responses to the items were not deviating much from the mean. The results were consistent with the study of King (2013) who established that liquidity risk was negatively related to bank performance in market-based financial system. However, it is observable that despite the impressive liquidity measurement from the findings of the study, most DT-SACCOs were often unable to meet their short term obligations to their members, particularly the disbursement of loans. This irony was occasioned by the fact that the bulk of liquidity pressures in DT-SACCOs are normally occasioned by demand for loans, which once a member is qualified is deemed a right, unlike in the banking sector.

Secondary data was obtained from various sources such as SACCOs reports. The data was cleaned and organized in excel for further analysis. Table 2 shows the distribution of secondary data over the years.

Table 2. Summary Statistics of the Variables

Year	2013	2014	2015	2016	2017	Overall (2013 to 2017)	
	Mean	Mean	Mean	Mean	Mean	Mean	Std
Return on Assets	11.12	9.05	10.56	11.19	12.01	10.786	1.09
Returns on Investment	6.4	5.46	5.97	6.81	6.54	6.236	0.52
Loan to Deposit Ratio	0.756	0.612	0.635	0.542	0.974	0.958	0.90

Source: Data Processed

As shown in Table 2 ROA (proxy measure of DT SACCOs financial performance) values increased from 11.12% in 2013 to 12.01% in 2017. The results also showed that except for year 2014, there was an upward trend in return on investments. The ROI decreased from 6.4 in 2013 to 5.46 in 2014 and then increased gradually to 6.81% to 2016 before slightly falling to 6.54 in 2017. A drop in return on assets in 2014 was attributed to slight decline in business activities in deposit taking SACCOs immediately after the electioneering period in 2013. Though the number of members increased in 2014 and 2017, the observed decline in return on investment in those years was partly attributed to political environment preceding electioneering period which dampened deposit taking SACCOs' core business activities. The results revealed that the loan to deposit ratio which was used as a proxy measure of liquidity risk in this study had a declining trend from year 2013 to year 2016 but increased again in 2017. The changes in trend can be explained by practices employed by DT SACCOs to manage liquidity risks.

Correlation between Liquidity Risk and Financial Performance of SACCOs

The study conducted a correlation analysis between liquidity risk and financial performance of SACCOs as shown in Table 3.

Table 3: Correlation between Liquidity Risk and Financial Performance of SACCOs

		Liquidity Risk
Financial Performance of DT SACCOs	Pearson Correlation	-0.226**
	Sig. (2-tailed)	0.001
Valid N		**74**

**Correlation is significant at the 0.05 level (2-tailed)

From Table 3, liquidity risk had coefficient of correlation value of -0.226 with ROA at 95% confidence level. This correlation coefficient value lies between -0.1 and -0.3 indicating a very weak negative linear association between liquidity risk and ROA. The results further showed that liquidity risk also had p value equal 0.001 with ROA at 95% confidence level. The relationship was tested at 95% confidence level with a 2-tailed test where the probability value was found to be less than 0.05 indicating that there was a significant relationship between liquidity risk and ROA. The results were in tandem with those of Makaa and Ondigo (2013) who found that profitability of the commercial banks in Kenya was negatively affected by increase in liquidity gap and leverage. It was observed that with significant liquidity gap, banks may have to borrow from the repo market even at a higher rate thereby pushing up the cost of funds.

Stationarity of the Variables

Prior to conducting panel data regression, the study conducted unit root test which is also known as stationarity test. Stationarity test was conducted using Fishers method. In the context of panel data unit-root tests, the test performs a unit-root test on each panel's

series separately, and then combines the p-values to obtain an overall test of whether the panel series contains a unit root. The null hypothesis being tested by fisher is that all panels contain a unit root. Table 4 shows the stationarity tests of liquidity risk data.

Table 4: Liquidity Risk Stationarity tests

		Statistic	P-Value
Inverse Chi-squared (148)	P	838.4656	0.000
Inverse normal	Z	-4.4334	0.000
Inverse logit t(324)	L*	-19.7705	0.000
Modified inv. Chi-squared	Pm	40.1325	0.000

Source: Data Processed

From the Table 4, the p-value of the inverse chi-squared, inverse normal, inverse logit and modified inverse chi-squared is 0.000 which is less than 0.05. Therefore, the study rejects the null hypotheses that the entire liquidity risk panels contain unit roots hence the panels are stationary.

Regression Model Prior to Moderation

Fixed effects model and random effects model and random effects model were conducted. Hausman test was conducted to select one model between the two models. Fixed effects model was selected and appropriate for this study. The results of the fixed effects model are as shown in Table 5.

Table 5: Regression Results Model

Number of Observation			370			
Number of Panels			74			
R-sq – within			0.2231			
Between			0.0227			
Overall			0.1534			
F (1,74)			17.24			
Prob>F			0.002			
Financial Performance	**Coef.**	**Robust. Std.err**	**T**	**p>|t|**	**[95% Conf. Interval]**	
Liquidity Risk	-1.49	0.4733325	-3.15	0.002	-2.433	-0.547
Cons.	-0.811	4.959465	-0.16	0.870	-10.693	9.070

Dependent variable is ROA*

Source: Data Processed

The regression result presented in Table 5, the F-statistic was 17.24 and its respective p-value was 0.000 which is less than 0.05 hence the liquidity risk is significant predictors of dependent variable. The results indicated that the overall regression model was statistically significant at 5% significance level and could therefore be used for prediction purposes. This further indicated that the independent variables were statistically significant in predicting financial performance of deposit taking SACCOs.

The R-square of 0.1534 implies that the independent variable explain 15.34 percent changes in dependent variable (ROA). This implies that other factors not studied in this research contributed 84.66% variation of financial performance of DT-SACCOs. A further research should therefore be conducted to investigate factors that could affect financial performance of DT-SACCOs.

At 95% level of significance, the p.value (p=0.002) of liquidity risk were less than the 0.05. Hence, liquidity risk had a statistically significant influence financial performance of deposit taking SACCOs. The relationship is between liquidity risk and financial performance of DT SACCOs is negative as revealed by the regression coefficient of -0.8119.

Results and Discussion

The influence of liquidity risk on financial performance in this study was statistically significant. The DT SACCO management should therefore strike a balance between holding adequate deposits to meet members' loan obligations and investing of liquid cash in long term projects. The results of this study were consistent with Kamau and Njeru (2013), Gweyi, Olweny and Oloko (2018)**,** Makaa and Ondigo (2013) and Muriithi and Waweru (2017) studies which revealed negative relationship between liquidity risk and financial performance. However, study by Song'e (2015) contradicted these study findings because it concentrated on liquidity risk management and not liquidity risk as an interest rate driver. The results imply that Deposit Taking SACCOs that regularly prepare accurate cash flow projection statements are able to predict future demands of both members and lenders. DT-SACCOs facing liquidity problems frequently fail to meet loan application demands of the members. The inability to service members loan demands

can lead to mass withdrawal of members from the SACCO with a consequent effect of decline in profitability or in as worst case scenario the total collapse of the DT-SACCO.

Conclusions

The correlation results revealed negative relationship between liquidity risk and financial performance of DT SACCOs. The deposit taking SACCOs with low asset base experience instability in funding. SACCOs that are in financial distress either use liquid assets or external funding to meet members' loan requirements which consequently increase the cost of funding which ultimately reduces financial performance.

The study through panel data regression analysis proved that the effect of liquidity risk on financial performance of deposit taking SACCOs was negative and statistically significant. Deposit taking SACCOs issue loans to members subject to availability of funds at their disposal. In this regard, it is very important that optimal liquidity should be maintained by deposit taking SACCOs to allow for scheduled loan disbursements and a margin of safety.

Basing on the study findings, it is recommended that DT SACCOs should focus on improving mobilization of deposits by DT-SACCOs to ensure that all their assets are financed from the internally generated funds, and that the DT-SACCO system is capable of generating sufficient internal liquidity capable of facilitating its operations, lending to members and among the DT-SACCOs themselves. Deposit taking SACCOs should ensure that diversified source of funding portfolio is maintained to reduce liquidity risk. SASRA (Sacco Society's Regulatory Authority) should develop legal and institutional framework to protect SACCOs from employers that do not remit employees SACCO deductions. SASRA should enact market conduct regulations to tame malpractices like inflated charges, delays in reimbursement of deposit and reckless lending.

The study was limited to the fact that it looked only at liquidity risk. However, liquidity risk is interconnected with other risks such as credit risk and market risk. In that regard, future studies should focus on other types of risks as control variables when examining the linkages between liquidity risk and DTS financial performance metrics. Additionally, it is important to consider the DTS financial risk management policies and regulations as a moderator of liquidity risk.

References

Baumol, J.M. & Tobin, R. (1952). On the Social Rate of Discount, *American Economic Review*, 788 - 802.

Feisal, A. I., & Masinde, S. W. (2015). Does Credit Rating have any Effect on the Performance of Savings and Credit Co-Operative Societies in Kenya? *International Journal of Management Research and Reviews*, *5*(2),48.

Gao, H., Harford, J., & Li, K. (2013). Determinants of Corporate Cash Policy: Insights from

Getachew, K. (2017). *Determinants of Commercial Banks Deposit Mobilization in Ethiopia* (Doctoral Dissertation, St. Mary's University).

Gweyi, M. O., & Karanja, J. (2014). Effect of Financial Leverage on Financial Performance of Deposit Taking Savings and Credit Co-operative in Kenya. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, *4*(2), 180-265.

Gweyi, M.O., Olweny, N., Oloko, O. (2018). *Influence of Financial Risk on Financial Performance of Deposit*

Holburn, G. L., & Zelner, B. A. (2010). Political Capabilities, Policy Risk, and International Investment Strategy: Evidence from the Global Electric Power Generation Industry. *Strategic Management Journal*, *31*(12), 1290-1315.

Kamau, J. & Njeri, K., (2013). Effect of Central Bank of Kenya Regulations on the Financial Performance of Microfinance Bank. *Strategic Journal of Business &Change Management,* 5(1), 13-34.

Khan, M. K., & Syed, N. A. (2013). Liquidity Risk and Performance of the Banking System. *Journal of Social Research*, *3(2)*, 55-70.

Kimathi, C. (2015). Factors Leading to Increased Borrowing from Commercial Banks by Members of Mwalimu Savings and Credit Co-operative Society of Meru north District. *Strategic Journal of Business & Change Management*, *2*(1). 102-119.

King, M. R. (2013). The Basel III Net Stable Funding Ratio and Bank Net Interest Margins. *Journal of Banking & Finance*, *37*(11), 4144-4156.

Kivuvo, R. K., & Olweny. (2014). Financial Performance Analysis of Kenya's Sacco Sector using the Altman Z Score Model of Corporate Bankruptcy, *International Journal of Business and Social Science.* 5(1), 78-107.

Lainà, P. (2018). Money creation under full-reserve banking: a stock–flow consistent model. *Cambridge Journal of Economics*, *43*(5), 1219-1249.

Makaa, Z., & Ondigo, H. (2013). *The Relationship between Liquidity Risk and Financial Performance of Commercial Banks in Kenya*. (Doctoral Thesis University of Nairobi)

Marozva, G. (2015). Liquidity and Bank Performance. *International Journal of Economics and Business Research, 2*(3)*, 453-462.

Muheebwa, F., (2018). The Influence of Liquidity on the Financial Performance of SACCOs in Uganda. *Journal of Economics, 3(2)*, 55-70.

Muriithi, J. G., & Waweru, K. M. (2017). Liquidity Risk and Financial Performance of Commercial Banks in Kenya. *International Journal of Economics and Finance, 1*(1), 256

Njenga, S. M., Kiragu, D. N., & Opiyo, H. O. (2015). Influence of Financial Innovations on Financial Performance of Savings and Credit Co-operative Societies in Nyeri County Kenya. *European Journal of Business and Social Sciences*, *4*(06), 88-99

Njeri, C. M. (2017). *Determinants of Capital Adequacy in Kenya's SACCOs: A Case Study of Deposit Taking SACCOs in Nairobi* (Doctoral dissertation, United States International University-Africa).

Njeri, C. M. (2017). *Determinants of Capital Adequacy in Kenya's SACCOs: A Case Study of Deposit Taking SACCOs in Nairobi* (Doctoral dissertation, United States International University-Africa).

Nyanamba, S. O., Nyangweso, G. N., & Omari, S. M. (2013). Factors that Determine the Capital Structure among Micro-Enterprises: A Case Study of Micro-Enterprises in Kisii Town, Kenya. *American International Journal of Contemporary Research*, *3*(7), 139-147.

Ochanda, C. A. (2018). *The Effect of Interest Rates Caps on Bank Performance Amongst Kenyan Commercial Banks* (Doctoral dissertation, United States International University-Africa).

Olagunju, A., David, A. O., & Samuel, O. O. (2012). Liquidity Management and Commercial Banks' Profitability in Nigeria. *Research Journal of Finance and Accounting*, *2*(7-8), 24-38

Private Firms. *Journal of Financial Economics*, *109*(3), 623-639.

Sacco Societies Regulatory Authority. (2015). Sacco Supervisory Report. Retrieved from https://www.sasra.go.ke/index.php?option=com_phocadownload&view=category&download=96:supervision-report-2015&id=11:sacco-supervision-reports&Itemid=200

Shah, S.Q.A, Khan, I, Shah, S.S.A & Tahir, M. (2018). Factors affecting liquidity of banks: Empirical evidence from the banking sector of Pakistan. Colombo http://220.247.247.85:8081/handle/123456789/8206

Shen, C. H., Chen, Y. K., Kao, L. F., & Yeh, C. Y. (2009). Bank Liquidity Risk and Performance.*17th Conference on the Theories and Practices of Securities and Financial Markets,* Hsi-Tze Bay, Kaohsiung, Taiwan.

Song'e, H. K. (2015). *The Effect of on the Financial Performance of Deposit taking SACCOs in Nairobi County*, *1*(1), 35-40. *Taking Savings and Credit Co-operatives in Kenya* (Doctoral dissertation, JKUAT-COHRED).