International Journal of Community and Cooperative Studies
Vol.10 No.1, pp.63-74,2022
Published by ECRTD- UK
ISSN 2057-2611(Print),
ISSN 2057-262X(Online)

Loan Portfolio Diversification and Liquidity Risk of Deposit-Taking Savings and Credit Co-operative Organizations

[1]Changamu I.
The Co-operative University of Kenya, School of Co-operatives and Community Development,

[2]Ndegwa J.
The Co-operative University of Kenya, School of Business and Economics,

[3]Muthoni, D.
The Co-operative University of Kenya, School of Business and Economics,

Citation: Changamu I, Ndegwa J. and Muthoni, D. (2023) Loan Portfolio Diversification and Liquidity Risk of Deposit-Taking Savings and Credit Co-operative Organizations, *International Journal of Community and Cooperative Studies*, Vol.10 No.1, pp.63-74

ABSTRACT: *SACCOs play a crucial role in providing financial services to the section of the population that is left out by banks and other financial institutions. SACCOs, especially deposit-taking ones face various challenges in their daily operations, including difficulties in balancing their liquidity. The aim of this paper was to determine the influence of loan portfolio diversification on liquidity risk of deposit-taking SACCOs in Kenya. It specifically sought to test the hypothesis: Loan portfolio diversification has no significant influence on liquidity risk of deposit-taking SACCOs in Kenya. The researcher made use of secondary data collected from audited financial statements of deposit-taking SACCOs submitted to SASRA. Collected data encompassed panel data spanning a period of five years from 2013 to 2017 across deposit-taking SACCOs. The data was analyzed using panel data analysis. Regression and correlation analysis were also conducted to test the existing relationship between the dependent and independent variables. It was found that loan portfolio diversification had a significant influence on the liquidity of deposit taking SACCOs in Kenya. We recommend that SACCO Societies Regulatory Authority (SASRA) should review or formulate tight guidelines to be followed when SACCOs advance loans for personal use.*
KEY WORDS: Loan portfolio diversification, liquidity, performing loans, non-performing *loans*

INTRODUCTION

SACCOs are quasi-financial institutions that play an instrumental part by acting as financial mediators between depositors and the investors. SACCOs mobilize savings, extend loan facilities to members and provide many other products and services to their members (Githaka, Kimani & Gachora, 2017). They are important drivers in the provision of financial services to the populace that are, for whichever reason, left out of reach of the banks and other financial institutes. They also play a significant part in Kenya's financial segment

through the delivery of inexpensive financial facilities to their members who reside both in rural and urban setups.

Keynes (2019) defines liquidity as the capacity of any financial institution to fulfil its interim commitments, both collateral and cash at reasonable cost when they fall due without incurring extra charges. Many contemporary SACCOs, including those operating in Kenya face liquidity problems due to lack of withdrawable saving products and the fact that most of their funds are devoted to non-earning assets (Graham, 2007). Additionally, in Europe the prevailing distinction in fiscal transmission was as a result of adversative economic turn since 2008 that has resulted in amplified economic doubt, a failure in money market liquidity and uncertainties on the soundness of Euro region economic organizations and their monarchs (Ivo, 2014).

One of the primary issues facing the cooperative fiscal establishments in Africa is managing their liquidity and resource levels while at the same time fulfilling the fiscal desires of the members (Emma and Sam, 2009). In Kenya, for instance, SACCOs are mandated to keep 15% of their saving deposits and interim liabilities in liquid asset in compliance with liquidity risk practice (SASRA, 2012). According to the SACCO societies Regulations of 2010, the institutions are not allowed to get external borrowings more than 25% of their aggregate assets unless the limit is waived or otherwise by SASRA.

In Kenya, liquidity risk continues to be a concern for SACCOs and funding liquidity is a significant pointer of fiscal stability in a SACCO as it reveals its aptitude in meeting financial commitments as and when they fall due (Kimathi, 2014). As at December 31st 2012, average liquidity (net liquid assets divided by savings deposits and short-term liabilities) for the licensed DTS remained at 36 percent against a constitutional lowest of 15% and in 2016 stood at 49%, which is an upsurge from the preceding year's but a decrease compared to 2015. Nevertheless, the desire for loans still puts force on liquidity with the business ratio of advances to deposits beyond 100 percent (SASRA, 2012). As financial institutions, DT SACCOs should efficiently manage their funding liquidity risk in order to safely run their businesses, uphold favorable associations with the shareholders and avoid liquidity problems in the near future. They should also develop mechanisms to cushion themselves against the hard-hitting financial crises like the 2008 financial crisis or the sub-prime crisis in the United States. Many SACCOs get adversely affected by financial crises because of their laxity in adopting liquidity management practices that ensure that they maintain their liquidity. Insolvency of some SACCOs is majorly a result of liquidity risk mismanagement or poor decisions regarding liquid assets by the SACCO management. SACCOs, therefore, need to be advised on the best way possible to manage their liquidity risks.

Loan portfolio diversification is the process of minimizing the risk which might occur due to offering of products or funds to one class of individuals. It can simply be defined as a way of not placing all eggs in the same bag derived from Markowitz portfolio theory (Marling and Emanuelson, 2012). SACCOs used to have only one class of members in the past and this highly exposed them to liquidity risks. For instance, a SACCO could draw membership from

coffee farmers only and in case of any disaster on their production the institution will be affected to the extent of collapsing due to lack of deposits. It is clear that SACCOs today have diversified their membership and that has led to the loan portfolio diversification, where membership is drawn from all sectors of the economy. Without proper management of the loan products, SACCOs are likely to face liquidity problems in times of other economic difficulties.

Liquidity has an influence on the performance of SACCOs operating either in the global or regional scale. Poor management of liquidity risk has proven detrimental to the growth and profitability of firms (Das et al., 2015; BaFin & Deutsche Bundesbank, 2008). Firms that do not adopt appropriate liquidity management policies might end up collapsing during times of financial crises like the Sub-prime crisis of 2008. The collapse of Lehman Brothers which applied for bankruptcy even when the value of its assets exceeded the total debts can be one example of such cases (Lioudis, 2017). The collapse of Chase Bank and Imperial Bank in Kenya on April 2016 and October 2015 respectively was also partly attributed to the poor management of liquidity risk. Imperial Bank is said to have dished out bad loans to the wealthy and the mighty among the Kenyan elites whereas the high interest rates kept the common Kenyan away from accessing loans from the bank (Masinde, 2016). Chase bank was put under receivership by the Central Bank of Kenya on April 2016 when depositors acted on a rumor of the eminent collapse of the bank and ran to withdraw their deposits in what was termed as ‘panic withdrawal’. These and many other cases indicate that the management of liquidity risk remains a crucial tool for checking liquidity hazards amidst DT-SACCOs including the stated minimum requirement of 15% ratio. However, this has continued to reduce and thus a 2016 SASRA Supervisory Report indicates that it reduced from 55.90% in 2015 to 49.95% in 2016 (SASRA, 2018). In addition, the report shows that a mainstream of DT-SACCOs are incapable of fulfilling their short-term commitments to their affiliates, more so in loans disbursement. The inability has been attributed to the increased plea for loans, which once a member is competent is believed to be a right, unlike in the banking sector. The liquidity ratio shows that total loans to total deposits reduced from 108.80% in 2015 to 108.39% in 2016 and there was no significant increase in the liquid assets to total assets that reduced from 10.3 in 2013 to 9.95 percent in 2014 (SASRA, 2018). This poses a significant liquidity risk in Kenyan DT-SACCOs. Ochieng, Bogonko and Simiyu (2017) discovered that liquidity management or portfolio management had a great impact on SACCOs’ profitability. Song’e (2015) found out, in a study on the impact of liquidity management on DTS’ performance that there was a positive correlation between liquidity risk management and SACCO performance. Nonetheless, the study would not reveal the extent to which the liquidity risk management is associated with the financial performance of these SACCOs. Gweyi, Olweny and Oroko (2018) studied impact of liquidity risk on financial performance of deposit taking savings and credit societies in Kenya. In the investigation, an inverse relationship between financial performance of SACCOs and liquidity risk management showed no relationship between the two.

From the studies done in the Kenyan SACCOs environment, it is clear that they have principally assessed the effect of liquidity risk on financial performance, and restricted focus

has been given to the determinants of liquidity risk. This study sought to fill the gap in knowledge by addressing the following question: What is the influence of loan portfolio diversification on liquidity risk of deposit-taking SACCOs in Kenya?

The paper sought to test the following hypothesis:
H_{01} Loan portfolio diversification has no significant influence on liquidity risk of Deposit-taking SACCOs.

LITERATURE REVIEW

In his Modern Portfolio Theory (MPT), Harry Markowitz described how risk-averse financiers can form portfolios to augment their probable returns considering the level of existing market risk. Investors who emphasize that market risks are intrinsic parts of a higher returns can apply the theory in building their portfolios (Elton et al., 2009). Markowitz argued that the construction of an efficient frontier of ideal portfolios that offer a superior expected return possible for a specific risk level is possible when diversifying portfolios (Rudd & Clasing, 1988). The MPT assumes that all investors are risk-averse implying that they will only prefer to invest in less risky portfolios as opposed to more risky ones for a specific return level. Such investors can only invest in high-risk investment if only they expect the return from such investments to be higher. In this sense, when a firm diversifies its portfolio, then it is possible to minimize its liquidity risks, especially those arising from the lack of cash due to high lending activity.

This theory gives light to the study on the influence of loan portfolio on liquidity of DTSs in that it advises banks and SACCOs to reconsider their loan portfolios and ensure that they lend only to borrowers who do not present high risks of non-payment and promise a steady flow of future cash flows to meet the repayment obligations. Proper evaluation will help the banks and SACCOs mitigate against funding liquidity risks that face them from time to time, especially during financial crises like the 2008 Sub-prime crisis that led to the collapse of several financial institutions.

Banks and other commercial organizations have been able to improve their risk mitigation strategies by using advanced credit scoring models. Through these models and strict evaluation of credit, banks and other financial institutions have been able to avoid non-creditworthy borrowers thereby reducing the risk of default and other credit-specific risks (Dionne & David, 2005). Nevertheless, the application of the advanced scoring models has not fully minimized the total loan portfolio risk for these organizations calling for other risk mitigation strategies that can last for a longer period and are more effective. Diversification of loan portfolio can help these institutions to mitigate the risk of non-payment as well as funding liquidity risk as Dionne & David (2005) argue. Over time, banks and other financial institutions that deal with the provision of credit facilities like loans have not considered the correlation between the loan portfolio components and in the long-term, they may face high total portfolio credit risk in cases where the correlation between the components of the loan portfolio is high (Elton et al., 2009). Diversification of loan portfolios can, therefore help

these institutions to mitigate against such risks as credit, funding liquidity risks and non-payment risks.

Uddin and Haque (2016) studied the influences of asset liability management on profitability of banks in Bangladesh. Asset liability management (ALM) is a technique used to tackle the risks financial institutions face as a result of discrepancy between liabilities and assets and liquidity or interest rate fluctuations. The technique simply combines several systems of managing portfolio into a coordinated process (Oracle, 2008). The study employed Statistical Cost Accounting (SCA) model to determine the nature of relationship existing between different liability and assets variables with bank profitability. Time series information for selected banks from 2003 to 2014 was used in the study and financial ratios as well as diverse statistical tools to study the degree of association between the variables. Regression and descriptive analyses were also applied to identify the correlation amid the variables. The findings showed that advances and loans had a significant positive correlation with the effectiveness of the banks. The advancement of loans to borrowers for the selected banks was done as a way of managing their assets and liabilities and to mitigate against the risks of funding liquidity for these banks in the country. The study, however, failed to specifically consider how loan portfolio diversification would affect the bank's profitability had they used it as a liquidity management technique. In addition, the SCA model used in the study might not apply to other countries especially those with developed economies because it might result in a false impression of the liquidity or profitability situation in these countries.

Loan Portfolio diversification plays a crucial role in determining a firm's exposure to funding liquidity risks both in the short and long-term. Firms that diversify their loan portfolios not only improve their sources of finance, but also reduce the risk of non-payment because the evaluation process undertaken before loan approvals weeds out risky borrowers leaving those with high certainty of repaying their loans (Dionne & David, 2005). Bosco and Faustin (2016) studied "Loan Portfolio Management for Financial Profitability and Sustainability of Umwalimu SACCO in Rwanda" for a period of five years (from 2010-2014). Their aim was to find out the influence of the management of loan portfolio on the financial sustainability and profitability of MFIs. They utilized both secondary and primary data to reach their conclusions and draw recommendations. Using MFI Factsheet 3-4 SPSS and after conducting multiple regression analysis to determine the correlation and strength of association between variables under study, the analysis showed a significant p-value for most of the variables including amount of loan disbursed, duration of loan, management indicators of loans, profitability. Therefore, the researchers concluded that credit policies strongly influenced credit decisions thus credit policies (for instance, policies meant to diversify or not to diversify loan portfolio) can impact on an institution's success. If an institution adapts a risk-averse credit policy, it will reduce its loaning ability and, in the process, forgo the benefits of incomes it would have earned out of lending more to borrowers, a fact that will reduce its profits. Like any other financial institution, SACCOs are also affected by the credit policy decisions they adapt, especially those dealing with whether or not to diversify their loan portfolios. The study was significant in contributing to the existing knowledge on the impact of loan diversification on firm profitability.

Adzobu, Agbloyor and Aboagye (2017) conducted a study on "the effect of loan portfolio diversification on banks' risks and return: Evidence from an emerging market" using Ghanaian banks. The researchers wanted to determine whether credit portfolio diversification across sectors of the economy have a positive or undesirable impression on the level of risks facing the banks and their profitability. Annual data for 30 Ghanaian banks operating in the country between 2007 and 2014 was used to ascertain the impact of loan portfolio diversification on the performance of banks. The findings indicated that the bank's profitability does not improve with increased diversification of loan portfolios and that the diversification of loan portfolios did not prove to reduce the credit perils of the banks. The findings can also apply for some small SACCOs which can adversely be affected by diversification of loan portfolio owing to the small membership numbers. The findings of the study contribute to the existing literature on the impact of loan portfolio diversification on bank risks.

According to Githaka, Kimani and Gachora (2017) most SACCOs in Kirinyaga County diversified their loan portfolios. In a study on the influence of liquidity management on the liquidity of SACCOs in the county, the researchers found out that SACCOs offered different loan types depending on the relationship of the borrower with the SACCO. For instance, gross loans and SACCO loans were offered to other borrowers and SACCO members respectively. The findings indicated that members repaid their loans as scheduled meaning delinquency cases were minimal. The researchers noted another classification of loans called performing loans (PL) which a majority of the respondents settled that they are performing. When loans are performing, the borrowers are able to repay them and, in the process, improve the profitability of the SACCO and at the same time help the SACCO maintain its funding liquidity thereby reducing funding liquidity risks. The study is significant since it contributes to the current literature on the influence of management of liquidity on the liquidity and surplus of SACCOs. However, the study did not incorporate the license restriction moderating variable which perhaps would have changed the nature of correlation.

RESEARCH METHODOLOGY

We utilized a descriptive research design. The choice of this design was guided by the nature of data that was collected for analysis. Secondary data collected was wide and given that DT-SACCOs operate using the same model as those of commercial banks, the design was helpful in acquiring the requisite data necessary in finding answers to research questions. The target population of the study comprised of all the 174 deposit-taking SACCOs licensed by SASRA as per SASRA report (2018). A census was carried out targeting all the 174 deposit-taking SACCOs regulated by SASRA as at 2018. We made use of secondary data. Secondary data was extracted from the audited financial statements submitted to SASRA by the DT-SACCOs after registration by the commissioner of co-operatives and the websites of the SACCOs. The data covered a period of 5 years from 2013-2017. A secondary data collection instrument was used. The period was selected since it represents the period when a number of D-SACCOs were being registered in large numbers and the main source of data were the annual reports

and financial statements submitted to SASRA covering the mentioned period. The availability and completeness of data was taken into consideration.

To explore the influence of loan portfolio diversification on liquidity risk of deposit-taking SACCOs, we made use of the following analytical model:

$$LNLRisk_{it} = \beta_1 LNLPDivers_{it} + \alpha_{i+}\mu_{it}$$

Where;
LNLRisk = log of liquidity Risk
LNLPDivers = log of Loan Portfolio Diversification
α_i = Individual specific component that does not vary with time
μ_{it} = Within-entity error

DATA ANALYSIS AND RESULTS

The study sought to collect data from all the 175 DT-SACCOs in Kenya regulated by SASRA as at 2018. Secondary data was extracted from the financial statements submitted to SASRA after audit has been carried out and the data obtained was for 174 SACCOs, which was, however, unbalanced panel as some cross-sectional data was missing for some variables. The response rate was more than 90% which was way beyond the required and adequate rate of 75% as proposed by Bailey (1987) to be the adequacy threshold.

Table 1: Panel Data Declaration

```
. xtset panelid year
      panel variable:  panelid (unbalanced)
       time variable:  year, 2013 to 2017
              delta:  1 year
```

Table 1 above indicates that the panel data was unbalanced. Nonetheless, this did not have any effect on the methodology since balanced panel data analysis technique was strong to be utilized in unbalanced panels.

Table 2: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Liquidity Risk	869	105,000,000	201,000,000	0	1,780,000,000
Loan portfolio diversification	869	1,320,000,000	2,770,000,000	0	24,800,000,000

Table 2 shows the descriptive statistics test that was conducted before subjecting the data to a regression analysis. The average value of non-performing loans was reported as Ksh.105, 000,000. In terms of proportion of different loan products advanced, loans advanced for personal use reported the highest mean of Ksh.1, 320,000,000. Non-performing loans are

approximately 8 per cent of loans advanced for personal use. This, therefore, implies that in reducing non-performing loans, there is a need to relook at the loans advanced for personal use.

The study applied the Modified Wald test for groupwise heteroscedasticity. The null hypothesis indicated that the data was Homoscedasticity. The results of the test gave a chi2 statistic of 1.1e30 with a p value of 0.4628, which was greater than 0.05. Therefore, the study failed to reject the null hypothesis at 5% significance level and concluded that the residuals were homoscedastic.

Table 3: Test Result for Heteroskedasticity

chi2 (174)	1.1e+30
Prob>chi2	0.4628

Table 4: Random Results for Influence of Loan Diversification on Liquidity Risk

		RE
VARIABLE	**NOTATION**	**Liquidity Risk**
Diversification of loans portfolio	lnDivers	0.597*** (0.190) P-value=0.0000

Source: Data Analysis Results (2019)

From the results presented in table 3 above, the researcher found that diversification of loan portfolio has a positive effect on liquidity risk. This was significant at 1 percent. A one percent increase in loans advanced for personal purposes were found to increase the level of non-performing loans by 59.7 percent on average across SACCOs over time.

Table 5: Summary of Hypothesis Tested

Hypothesis	Results	Conclusion
Loan portfolio diversification has no significant effect on liquidity risk of deposit-taking SACCOs in Kenya	Significant coefficient estimate (β=0.597) p-value is less than 0.05 implying a significant effect	**Reject the H_{01}**

DISCUSSION OF RESULTS

The study endeavored to examine the influence of loan portfolio diversification on liquidity risk of deposit-taking SACCOs in Kenya. Secondary data based on the research objective was

collected and analyzed. Inferential analysis was carried out to assess the causal relationship between the study variables. The specific objective of the study was to examine the influence of loan portfolio diversification on the liquidity risk of deposit-taking SACCOs operating in Kenya.

The study used the panel data spanning a period of five years from 2013 to 2017 across 174 SACCOs. The panel was found to be unbalanced due to missing information arising from some SACCOs. Correlational analysis was conducted to establish if the variables had a significant correlation between them to drop one of them in running the model. The results revealed perfect positive correlation between the diversification of loan portfolio variables that is loans advanced for business and other uses (proportion of the loan). They were thus dropped in the estimation and only loan for personal use was used.

The investigator undertook the Hausman test to determine the appropriate model to use between the random effect and the fixed effect. The p-value from the Hausman test was found to be 0.0658 and hence the Random effect model was adopted. A further test was conducted to establish the random effects for the model. As such, the Breusch and Pagan Langragian test were conducted. The p-values were found to be 0.000 and thus the null hypothesis was rejected which implied that there is evidence of significant differences across the SACCOs. Thus, the random effect model and not a simple pooled OLS was preferred. According to Baltagi (2005), cross-sectional dependence and autocorrelation are problems in macro panels with long time series (over 20-30 years). This is not much of a problem in micro panels (few years and large number of cases) which is the case for the data the researcher used. These were, therefore, not tested in this study.

The ratio of proportion of different loan products to total loans was used as a measure of loan portfolio diversification of the DT SACCOs while liquidity risk was measured as a ratio of non-performing loans to total loans. The findings from the inferential analysis showed that loan portfolio diversification had a significant relationship with liquidity risk. This was significant at 1 percent. A one percent increase in loans advanced for personal purposes were found to increase the level of non-performing loans by 59.7 percent on average across SACCOs over time. It is, therefore, expected that with time the SACCOs experience an increase in terms total loans. Increase in total loans will lead to an increase in loans advanced to different sectors and this largely contribute to an increase in non-performing loans.

The findings were contrary to a study carried out by Adzobu, Agbloyor and Aboagye (2017) on “the effect of loan portfolio diversification on banks’ risks and return: Evidence from an emerging market” using Ghanaian banks. The researchers wanted to determine whether credit portfolio diversification across sectors of the economy have a positive or negative impact on the level of risks facing the banks and their profitability. Annual data for 30 Ghanaian banks operating in the country between 2007 and 2014 was used to ascertain the impact of loan portfolio diversification on the performance of banks. The findings indicated the diversification of loan portfolios did not prove to reduce the credit risks of the banks. The

study therefore, can be used to indicate that in SACCOs loan portfolio diversification is crucial and should not be left out as it greatly affects liquidity risk of the entities.

CONCLUSION AND RECOMMENDATIONS

We found out that diversification of loan portfolio by DT SACCOs had a positive effect on liquidity risk.The findings indicate that loans advancement to members for personal use are the strongest determinants of liquidity risk. Policy makers in the SACCO industry ought to come up with policies that are aimed at reducing the volume of loans advanced for this specific stream if they are to improve liquidity risk.

We recommend that SACCO Societies Regulatory Authority (SASRA) should review or formulate tight guidelines to be followed when SACCOs advance loans for personal use as the study found out that loans personal use tend to increase liquidity risk among SACCOs. The analysis indicated a positive significant relationship between liquidity risk and loans portfolio diversification. Therefore, there should be mechanisms to ensure that the DT-SACCOs limit the advancement of loans. Secondly, DT-SACCOs should minimize advancement of loans that customers apply for personal use purpose. The study finds that such loans increases the liquidity risk among SACCOs. SACCOs, therefore, need to advance loans to either businesspeople or other borrowers who borrow to invest as this is likely to reduce liquidity risk of the organizations. Finally, SASRA should formulate favorable and well-regulated withdrawal plans for SACCO customers to minimize the volume of funds that can be withdrawn for a given period to reduce liquidity risk among the SACCOs. Doing this will help the DT-SACCOs to maintain their liquidity at all times and significantly ensure smooth operations. There is a realization that increased withdrawals significantly reduce the amount of deposits or cash in the SACCOs which can, in turn lead to liquidity problems.

Declaration of Conflicting Interest
The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding
The authors received no financial support for the research, authorship and/or publication of this article.

ORDIC iD
Ian Changamu https://orcid.org/0000-0003-3664-648X

References

Adzobu, D. L., Agbloyor, E. K. & Aboagye, A. (2017). The effect of loan portfolio diversification on banks' risks and return: evidence from an emerging market. *Managerial Finance*, 43(11), 1274-1291

BaFin & Deutsche Bundesbank (2008). Liquidity risk management practices at selected German credit institutions. *Deutsche Bundesbank*. Retrieved from

https://www.bundesbank.de/Redaktion/EN/Downloads/Tasks/Banking_supervision/PDF/liquidity_risk_management_practices_at_selected_german_credit_institutions.pdf?__blob=publicationFile

Baltagi, B. H. (2005). *Econometric analysis of panel data*. New York: John Wiley.

Bosco, J. H., & Faustin, G. (2016). Analysis of Loan Portfolio Management for Financial Profitability and Sustainability of Umwalimu SACCO in Rwanda. *British Journal of Economics, Management & Trade*, 15(4), 1-16.

Dionne, C. & David, C. (2005). Banks' loan portfolio diversification. Masters and Bachelors Thesis. University of Gothenburg. Retrieved from https://gupea.ub.gu.se/bitstream/2077/1714/1/0405.41.pdf

Elton, E. J., Gruber, M. J., Brown, S. J., & Goetzmann, W. N. (2009). *Modern portfolio theory and investment analysis*. John Wiley & Sons.

Emma, A. and Sam, M. (2009). *African cooperative and the financial crisis.* International Labor Organisation, Dar es Salaam 2009.

Githaka, J. M., Kimani, E. M. & Gachora, S. (2017). Effect of liquidity management on liquidity of savings and credit co-operative societies in Kirinyaga County, Kenya. *International Academic Journal of Economics and Finance*, 2(3), 57-73

Graham, O. (2007). *Rural outreach and financial cooperatives; SACCOS in Kenya. Agricultural and rural development.*

Gweyi, O. M., Olweny, T. & Oloko, M (2018). Effect of liquidity risk on financial performance of deposit taking savings and credit societies in Kenya. *International Journal of Economics, Commerce and Management, 6* (1), 259-283

Ivo, A. (2014). *The Impact of sovereign and credit risk on interest rate convergence in euro area.* De Nederlandsche Bank NV Amsterdam.

Keynes, J.M. (2019). *The general theory of employment, interest and money*. USA: General Press.

Kimathi, P. M. (2014). The effect of financing strategies on the liquidity of Savings and Credit Co-operatives Societies Licensed by SACCO Societies Regulatory Authority Operating in Nairobi County. University of Nairobi. Unpublished.

Lioudis, N. (December 11, 2017). The collapse of Lehman Brothers: A case study. *Investopedia*. Retrieved from https://www.investopedia.com/articles/economics/09/lehman-brothers-collapse.asp

Masinde, J. (Dec. 16, 2016). Exotic holidays, gifts and the $380 million fraud that brought down a Kenyan bank. *Quartz Africa*. Retrieved from https://qz.com/864182/exotic-holidays-gifts-and-the-380-million-fraud-that-brought-down-a-kenyan-bank/

Ochieng, I. A., Bogonko, J., & Simiyu, R. (2017). The influence of liquidity of a portfolio on the financial performance of SACCOs in Kenya. *International Journal of Commerce and Management Research, 3* (9), 52-57.

Oracle (2008). Asset liability management: an overview. *White Paper*. Retrieved from http://www.oracle.com/us/industries/financial-services/045581.pdf

Rudd, A. & Clasing, H. K. (1988). *Modern portfolio theory: The principles of investment management*. California, USA: The University of California.

SASRA. (2012). Licensed deposit taking SACCOs. SACCO Supervision Annual Report 2012. Nairobi*: SACCO Societies Regulatory Authority*, 1(2), 7-16.

SASRA (2018). *List of Sacco Societies Licensed to Undertake Deposit- Taking Sacco Business in Kenya for the Financial Year Ending December 2018*. Retrieved from https://www.sasra.go.ke/index.php/resources/publications/category/15-licensed-saccos?download=112:2018-licensed-saccos

Song'e, K. H. (2015). The effect of liquidity management on the financial performance of deposit taking SACCOs in Nairobi County. University of Nairobi, unpublished. http://erepository.uonbi.ac.ke/bitstream/handle/11295/92992/Song%E2%80%99e,%20Harrison%20K_The%20effect%20of%20liquidity%20management%20on%20the%20financial%20performance%20of%20deposit%20taking%20saccos%20in%20Nairobi%20county.pdf?sequence=3&isAllowed=y

Uddin, S. & Haque, A. (2016). The impacts of asset liability management on profitability of selected Banks in Bangladesh. *The Cost and Management*, 44(4), 20-26