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## Article

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# FINANCIAL INNOVATION PRACTICE, SACCO SIZE AND FINANCIAL SUSTAINABILITY OF DEPOSIT TAKING SAVING AND CREDIT CO-OPERATIVES IN KENYA

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## Abstract

The study aimed at assessing the moderating effect of SACCO size on the nexus between financial innovation practice and financial sustainability which was anchored on transaction cost innovation theory. The population for the study was the Deposit Taking Saving and Credit Co-operatives in Kenya. The study adopted a philosophical paradigm of positivism and descriptive cross-sectional survey design where the sample size was 119 respondents out of which 113 responded. Emailed questionnaire and data collection sheet were used in data collection. The study found that the process innovation and service innovation are positively related to financial sustainability but not statistically significant. This study concluded that SACCO size is statistically significant in moderating financial innovation practice and financial sustainability of Deposit Taking Saving and Credit Co-operatives in Kenya. The study recommends that Deposit Taking Saving and Credit Co-operatives should continue to invest in new and promising process and service innovation strategies to continue realizing the benefits of financially sustainable enterprise.

**Keywords:** Process innovation, Service innovation, Financial Self-sufficiency, Total assets.

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**JEL Classification:** G21, O32, P13

### **1. Introduction**

Financial sustainability is the ability of an organisation to continue offering services and meeting its current costs while attaining its goals for a foreseeable future. Financial innovation has been seen to be a solution to many financial problems such as increased costs and risks, thus improving its financial sustainability and competitive advantage (Gubler, 2011). After the global financial crisis of 2007/8, the financial system has encountered changes in their financial intermediation role and Savings and Credit Co-operatives (SACCOs) have not been left behind (Onwonga, 2016). In promotion of financial inclusion and financial deepening SACCOs worldwide recently have experienced major financial innovation in their effort of offering financial services to the marginalized persons and middle-income earners. This has been highly embraced in countries like Colombia, India, Brazil and USA (Duguma & Han, 2018). The financial innovations in SACCOs are of much importance more so to Africa in its fight against poverty as enshrined in sustainable development goals. Africa contribute to 48 percent of poverty level worldwide (Omilola & Lerven, 2019).

Since African SACCOs are members owned, they need to finance themselves without relying on grants and donor funding which are not fully sustainable (Tumwine, 2015). Thus, they need to have differentiated products and services that are customers centered so as to attract more members. Developing of innovated savings products have assisted Ethiopian SACCOs mobilize more deposits which assist them remain financially sustainable. SACCOs automation and digitization has made transactions paperless, easier and open in African countries like South Africa, Uganda, Malawi and Kenya. It reduces the SACCOs operational costs though widening its members size beyond borders (Duguma & Han, 2018).

Kenyan SACCOs have been in the forefront in Africa and ranked 11th position globally (WOCCU, 2018). The sector consists of Deposit Taking Savings and Credit Co-operative Societies (DT-SACCOs) and non-Deposit Taking Savings and Credit Co-operative Societies (Mugo et al., 2018). SACCOs that offer back office services activities are supervised by the Commissioner for Co-operatives. Additionally, those that offer front office services activities are licensed and regulated by SASRA but they have to be fully registered under the

Cooperative Societies Act CAP 490. A 6.3 percent of Kenyans are members of DT-SACCOs which employ over 250,000 people and over 60 percent of the population depends on SACCO related activities (FinAccess, 2016). They also contribute by 45 percent to the Kenya's gross domestic product. The asset base of these societies has grown from Kshs 442 billion in 2017 to Kshs 495 billion in 2018. Deposits have also increased from Kshs 305 billion in 2015 to Kshs 341 billion in 2018 (SASRA, 2018). This can be attributed to DT-SACCOs offering bank-like services, such as current and saving accounts, debit cards, advances and money transfers. Front office services activities came about after banks regarded many rural areas as increasing their operation costs and the population was left un-banked (Njenga, et al., 2015).

Kenya has made herself a hub for financial innovations like agency and mobile banking which has assisted in financial deepening. DT-SACCOs has embraced this technology in offering their products and services such as cash deposits, withdrawal of cash and opening of accounts to the unbanked in the society which puts them in a better competitive position (Moki, et al., 2019). Additionally, they have invested more on internet and mobile banking as compared to use of automatic teller machines. Financial innovation has contributed to easy and quick access of information and services to the clientele and reduced the ever-increasing operation costs of the DT-SACCOs. Thus, DT-SACCOs that embrace financial innovation are more likely to be financially sustainable than those that don't (Njenga, et al., 2015). This has seen DT-SACCOs accept usage of innovated products like credit cards, feature codes, M-pesa and debit cards which provide a platform for e-commerce. Hence, leading to upgraded service delivery, enhanced efficiency, and condensed operational costs (Sum & Memba, 2016). Financial innovation is utilized by the DT-SACCOs that are in search of more returns as they minimize risks. This is witnessed by DT-SACCOs in Kenya upgrading from common bond to open bond to attract more deposits from large population of clients or members (Simiyu & Olweny, 2018).

## **2. Problem statement**

Financial innovation practice increase has been found to reduce the transaction cost, thus leading to emergence of financially sustainable enterprise. This had led to DT-SACCOs investing heavily

on financial innovation practices (Gubler, 2011; Duguma & Han, 2018). The government has also invested in an oversight authority that ensures they are compliant to financial innovation guidelines to maintain financial sustainability. Regardless of this, risk of theft or fraud by committee members has increased by 19.4 percent, fraud by non-group member by 3.8 percent and members defaults by 5.23 percent (Njoroge, et al., 2019). This poses a threat to delivery of quality and affordable financial services to members with an aim of enhancing their standard of living. Additionally, achievement of sustainable development goals and vision 2030 objective of increasing financial inclusion is threatened thus posing great threat to the economy at large (Price Waterhouse Coopers [PwC], 2011). This is so because DT-SACCOs are one of the major sources of employment and capital for start-ups and business expansion. The increasing demise of 10.8 percent of the DT-SACCOs would lead to high rate of entrepreneurial decline and job loss hence the gross domestic product will decline (SASRA, 2017). Owing to all these, a solution is vital to avoid members losing value for their hard-earned money since deposits are not protected and DT-SACCOs do not have access to lender of last resort in case they are financially unsustainable. Nevertheless, large size SACCOs embrace financial innovation more than the small size, owing to the economies of scale enjoyed (Sebhatu, 2012). Hence, the objective of this study is to evaluate whether the SACCO size have a moderating effect on the nexus between financial innovation and financial sustainability of Deposit Taking Savings and Credit Co-operative Societies.

### **3. Literature review**

The study is anchored on the transaction cost innovation theory by Hicks and Niehans (1983). The theory states that financial innovation is carried to reduce the transaction cost. Financial innovators respond to technology progression leading to financial services enhancement. In addition, financial innovation is reviewed from microscopic economic structure change viewpoint, where it aims at reducing transaction cost and risk resulting to earning more benefits. Financial innovation is seen as a catalyst to firm growth and performance (Gubler, 2011). Transaction cost innovation theory is based on an internet-related information technology which lowers an organisation operation costs as it allows wide access to internal

database and important information quickly. Reduction of transaction cost in DT-SACCOs has seen financial innovation take place which is evident by introduction of internet, mobile and agency banking (Njenga, et al., 2015). Efficient coordination and administration have also been witnessed through automation and computerization of offices which is expected to improve the financial sustainability of DT-SACCOs (Kimotho & Muturi, 2019). Though Saving and Credit Co-operative Societies have not been left behind in use of financial innovation they need to improve their pace since telecommunication sector has started offering micro products which are appealing to clients. This may help them improve their market share for a foreseeable future.

Various empirical review based on study variables were established. Moki, et al. (2019) carried out a study on financial innovation strategy and financial performance of DT-SACCOs in Nairobi City County. Open system theory, financial intermediation theory and life cycle saving theory guided the study. Descriptive research design and causal research design were used in the study where the target population consisted of forty registered DT-SACCOs in the City County. The findings of the study indicated that there was a significant relationship between financial innovation and financial performance. Firms that did not implement financial innovation were bound to be delicensed due to their financial unsustainability. However, the study failed to mention those who responded to the questionnaires issued.

Ndwiga and Maina (2018) established that process innovation had a significant and positive nexus on financial performance while product innovation did not. Their study of financial innovation and financial performance of listed commercial banks in Kenya was based on two theories: constraint-induced financial innovation theory and transaction cost innovation theory. Cross-sectional survey research design was used. The eleven financial managers who were the study respondents were issued with a questionnaire. Secondary data was also collected using a data sheet from the annual reports of 2009 to 2016. The data of post global financial crisis were analysed using descriptive and inferential statistics, that is, multiple linear regression. The commercial banks were found to innovate their products and processes though this was not fully carried out. Product innovation consisted of new debit cards, credit cards, loan accounts and savings accounts while process innovation was based on use of mobile banking, internet banking and agency banking. The study concluded

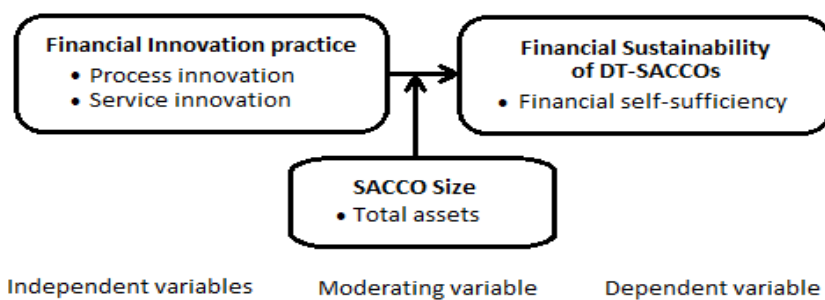
that only process costing had a significant positive nexus. The recommendations made stated that more process innovation would reduce the operational costs, unproductive products need to be dropped thus making them banks financially sustainable. The study however, relied on two types on financial innovation while there are other types of innovation. Thus, the study needs to incorporate all other types of financial innovation so as to arrive at a concrete conclusion and recommendations as well.

Sum and Memba (2016), carried out a study on the effect of financial innovation on the financial performance of DT-SACCOs in Kenya, a case of Kiambu County. The independent variables for the study were product innovation, process innovation, service innovation and institutional innovation while dependent variable was the financial performance with return on assets, liquidity ratio, core capital to total assets and non-performing loans to total gross loans being its parameters. A questionnaire was used to collect the data. Financial innovation was found to have a significant relationship with financial performance as evidenced from regression model. To better the financial performance of the SACCOs the study recommended that they adopt different financial innovation since all types of financial innovation were found to enhance financial performance. The study has no clear direction on how they arrived at the sample size used in addition to the anchoring of the theories to the study variables.

Tsuma et al. (2015), in their study on the effect of financial innovations on financial performance of SACCOs in Kenya were guided by the transaction cost innovation theory. The objective of the study was to determine the effects of process innovation on financial performance of SACCOs in Kenya. Descriptive research design was adopted with data being gathered using structured questionnaires. The findings of the study revealed that the SACCOs had embraced financial innovation but not fully. Additionally, correlation analysis results indicated that there is a strong positive relationship between process innovation and dividend per share when used as a proxy for financial performance. The study further established that technological innovations such as internet banking and connectivity, ICT, and computer technology, have led to lower operational costs in the Saving and Credit Co-operative Societies. This has led to improved competence, better service delivery, enhanced operational performance among many others. However, the study scope was weak as it looked only on process innovation while there are other types of

innovations in Saving and Credit Co-operative Societies. The researcher did not portray how Kakamega Teachers' Co-operative Society limited is representative of Saving and Credit Co-operative Societies in Kenya, thus the study results cannot be used to represent all Saving and Credit Co-operative Societies in Kenya.

#### 4. Conceptual framework



Source: Authors' illustration

#### 5. Research methodology

The philosophical paradigm of positivism with a descriptive cross-sectional survey design was used in the study. In selecting the sample size, the study used the 5 clusters of DT-SACCOs based on original field of membership; the government-based DT-SACCOs, teachers-based DT-SACCOs, farmers-based DT-SACCOs, private based DT-SACCOs and community-based DT-SACCOs. This resulted to 119 respondents. The primary quantitative data was collected by use of an emailed questionnaire while secondary data was collected from the audited DT-SACCOs financial statements and SACCO reports. The computed Cronbach's Alpha Coefficient of 0.764 attested the reliability of the questionnaire. Binary logistic regression model was used in establishing the relationship between the independent variables and the dependent variable. In determination of the variation of binary response variable Cox and Snell's R-square was used. However, Nagelkerke's R-Square was used to test the strength of the relationship of the independent variable and dependent variable. The goodness of fit of the model was tested using Hosmer and Lemeshow test. Wald test was carried out to test the significance for individual independent variables at 5% significance level for the P-values.



## **6. Results and discussions**

This section presents the results and discussions of response rate, the descriptive results, and the hypothesis test.

### **6.1. Respondents' response rate**

A total of 119 questionnaires were distributed and out of that, 113 questionnaires were returned and analysed. This gave response rate of 95%. A response rate above 60 percent is considered to be good, 70 percent to 85 percent is very good while above 85 percent is excellent (Marsden & Wright, 2010). Thus, the response rate of 95 percent was considered to be excellent for the study. The data collected was analysed and used in making important interpretation in line with the study objectives.

### **6.2. Financial innovation practice descriptive results**

The study descriptive results are exemplified in this section. The study sought to determine the influence of financial innovation practice on financial sustainability of DT-SACCOs. The respondents were required to indicate their level of agreement and disagreement in relation to the statements, with strongly agree allocated the highest score of 5 and strongly disagree a lower score of 1.

The descriptive statistics were computed. The findings revealed that DT-SACCOs have embraced financial innovation through regularly digitization of services as well as members receiving services via unstructured supplementary service data which had a mean score of 3.70 and 3.20 out of 5, respectively. In addition, new products are regularly generated to satisfy customer needs which scored 3.01. This has been necessitated by the need of DT-SACCOs to mobilize more funds from new members to remain financially sustainable as they improve members welfare. Nevertheless, DT-SACCOs are yet to fully make use of internet banking, electronic fund transfers and to computerize the finance records as their scores were moderate at mean of 2.73, 2.39 and 2.00, respectively.

The parameters used were measuring similar construct. Principle component analysis was used to reduce observed variables into factors to improve construct validity. Test for multicollinearity was first carried out. The calculated correlation matrix determinant was 0.45 which is more than recommended value of 0.00001 thus, indicating absence of multicollinearity between variables. The Kaiser-Meyer-Olkin and Bartlett's measure of sampling adequacy was used to

determine whether factor analysis is appropriate for the study. The computed value for the Kaiser-Meyer-Olkin measure of sampling adequacy was 0.647 while Bartlett's test of Sphericity at approximated Chi-square of 337.796 and 15 degrees of freedom it was highly significant with a P value of 0.000 and thus, appropriate for factor reduction.

Principal components method of extraction and varimax rotation was further carried out. The components with an Eigen value greater than one were retained (Field, 2013). Two factors (service innovation and process innovation) were extracted which explained 73.931 percent of the variance of financial innovation practice. The variables were further used in the logistic regression.

### **6.3. Financial innovation practice and financial sustainability binary logistic regression**

The null hypothesis to test that there is no relationship between financial innovation practice and financial sustainability of DT-SACCOs was carried out. The researcher assessed the individual effects of the independent sub-variables. The following equation was used to test the hypothesis.

$$\text{Logit } [p] = \ln \frac{p}{1-p} = \beta_0 + \beta_1 PI + \beta_2 SI \quad (1)$$

Where: P is the probability that a DT-SACCOs will be financially sustainable;  $\beta_0$  is constant;  $\beta_1$  and  $\beta_2$  are the coefficients from the log of the odds ratio function; I and SI are the predictor variables (process innovation and service innovation).

The omnibus test against the model with only a constant was significant at a Chi-square of 17.149 with 4 degree of freedom and a P value of 0.002 ( $P=0.001 < 0.05$ ), indicating the capability of predicting the response variable. To test the strength of the nexus between independent variable and dependent variable -2 Log likelihood and Pseudo R squared was used. The study results indicated that -2 Log likelihood was 69.270, Cox and Snell R square was 6.2 percent and Nagelkerke R square was 12.6 percent. Nagelkerke R Square indicated that 12.6 percent of the variations were elucidated by the study variables.

Hosmer and Lemeshow test, was conducted to determine whether the model was a good fit. The results of the test had a Chi-square of 5.368,7 degrees of freedom and a P value of 0.615. Well-fitting models show non-significance on the Hosmer and Lemeshow

goodness-of-fit test. This desirable outcome of non-significance indicates that the model prediction does not significantly differ from the observed (Yang & Miller, 2008). The Hosmer and Lemeshow statistic have a significance of 0.615 which is greater than 5 percent significance level. This means that it is not statistically significant and therefore the model is quite a good fit for the fitted logistic regression. However, the classification table indicated that the model predictions were correct 102 out of 113 times for an overall success rate of 90.3 percent which is greater than the recommended 50 percent, thus it can be replicated. The binary logistic regression results are shown in Table 1 where each variable coefficient of Regression (B), Wald statistic and Odd ratios (Exp (B)) are produced.

**Table 1**

**Variables in the equation**

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1a	Process innovation	.183	.099	3.375	1	.066	1.200
	Service innovation	.455	.334	1.851	1	.174	1.576
	Constant	-2.260	1.860	1.477	1	.224	.104

*a. Variable(s) entered on step 1: Process innovation, Service innovation.*

The model for the study:

Logit of (Financial sustainability) = -2.260 + 0.183 process innovation + 0.455 service innovation. The log of odds of a DT-SACCO being financially sustainable was positively related to process innovation and service innovation. Thus, an increase in one unit of predictor variable will lead to an increase in financial sustainability by its coefficient. The odd ratio (Exp (B)) indicates the overall effect on response variable of increasing the predictor variables. The study established that process innovation was not statistically significant in prediction of financial sustainability of DT-SACCOs (Wald statistic value = 3.375 with 1 df, a P = 0.066 > 0.05 and an odd ratio = 1.200). This disagrees with the studies carried out by Ndwiga and Maina (2018) and Tsuma et al. (2015), who found that process innovation had a significant relationship with the response variable. They noted that process innovation had the capability of reducing the operational cost hence resulting to a financially sustainable enterprise. The results further established that service innovation was not statistically

significant in prediction of financial sustainability of DT-SACCOs (Wald statistic value = 1.851 with 1 df, a P value = 0.174>0.05 and an odd ratio of 1.576). The study findings are in contrast with Sum and Memba (2016) research which found out that service innovation significantly influences the financial sustainability of DT-SACCOs.

**6.4. Moderating effect of SACCO size on financial innovation practice and financial sustainability**

The study tested whether SACCO size had any moderating effect on financial innovation practice and financial sustainability of DT-SACCOs. The test on moderation effects presents a hierarchical regression results for the moderation effects of SACCO size on financial innovation practice and financial sustainability. The moderation effect was hierarchically analysed as indicated in equation 2, 3 and 4.

$$\text{Logit } [p] = \beta_0 + \beta_1PI + \beta_2SI + \varepsilon \tag{2}$$

$$\text{Logit } [p] = \beta_0 + \beta_1PI + \beta_2SI + \beta_3SZ + \varepsilon \tag{3}$$

$$\text{Logit } [p] = \beta_0 + \beta_1PI + \beta_2SI + \beta_3SZ + \beta_4PI*SZ + \beta_5SI*SZ + \varepsilon \tag{4}$$

Where:  $\beta_0$  is a constant;  $\beta_1, \beta_2, \beta_3, \beta_4$  and  $\beta_5$  are coefficients; P is the probability that a DT-SACCOs will be financially sustainable; PI and SI are the predictor variables (process innovation and service innovation); SZ - Sacco size.

The results of moderation effect of SACCO size on the financial innovation practices and financial sustainability are indicated in Table 2.

**Table 2**

**Hierarchical Regression Results**

Predictors	Model 1			Model 2			Model 3		
	Beta <sup>a</sup>	Wald	P	Beta <sup>a</sup>	Wald	P	Beta <sup>a</sup>	Wald	P
(Constant)	-2.260	1.477	.224	4.086	.039	.843	-135.331	1.790	.181
PI	.183	3.375	.066	.270	.709	.373	4.378	2.663	.103
SI	.455	1.851	.174	.520	1.690	.194	11.902	.348	.555
SZ				-.825	.095	.758	15.175	1.763	.184
PI*SZ							-.472	2.337	.126
SI*SZ							-1.323	.346	.556
Nagelkerke R <sup>2</sup>	.126			.128			.224		

Source: Data analysed by authors.

The results of the moderation indicate that the predictor variables interacted when combined and they were insignificant at 5 percent. The model changes on the strength of relationship was from 12.6 percent to 12.8 percent with introduction of the moderator SACCO size. However, with interaction, Nagelkerke R Square changed from 12.6 percent to 22.4 percent which had the highest influence. This means that there was significant increase in the variations which was determined by the study variable. Therefore, from the study results it is evident that the relationship improved as various interactions were introduced in the models. A continued improvement of the Nagelkerke R Square with the introduction of a moderator and the interactions in the model indicates the significance of the moderator in the study (O'Connell, 2006). The study therefore rejects null hypothesis that, SACCO size is not statistically significant in moderating financial innovation practice and financial sustainability of DT-SACCOs in Kenya. This in agreement with Opalo (2014) who observed that SACCO size have a significant positive moderation effect on the response variable. In contrary Onwonga (2016) who adopted size as a moderator and indicated that it has no moderating effect between the independent variable and dependent variable.

## **7. Conclusion and Recommendation**

The study concluded that process innovation and service innovation was not statistically significant in prediction of financial sustainability of a DT-SACCOs. Since they exhibited a positive relationship with the response variable, they were found to be in support of transaction cost innovation theory. Financial innovation in DT-SACCOs is aimed at reducing transaction cost and risk and earning more benefits. However, SACCO size is statistically significant in moderating financial innovation practice and financial sustainability of DT-SACCOs in Kenya. The study made various recommendations. DT-SACCOs should continue to invest in new and promising process innovation strategies to continue realizing the benefits that accrue from it e.g. improved customer satisfaction and operational costs reduction. This will caution the DT-SACCOs from financial distress or bankruptcy as they will be financially sustainable. The DT-SACCOs should invest in advertising their process innovation strategies to attract more members thus reducing the unbanked population in the country.

To better manage and serve the many members of the DT-SACCOs well all finance records should be computerized and digitized for easier access by members at an affordable cost. This assist in facilitating real time transaction in the enterprise. Since the members of the DT-SACCOs are the unbanked studies have shown that they do not have access to feature mobile phone, hence, the use of unstructured supplementary service data (USSD) should be embraced. The mobile service providers, however, should improve their network coverage reach to all parts of the country. This will assist the DT-SACCOs access those seven counties with no DT-SACCOs presence, hence increased financial inclusion.

### References

1. Duguma, G.J. & Han, J. (2018). "Effect of Deposit Mobilization on the Financial Sustainability of Rural Saving and Credit Cooperatives: Evidence from Ethiopia". *Sustainability*, Volume 10, pp. 1-23.
2. Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics*. 4th ed. Los Angeles -USA: SAGE Publication Limited.
3. FinAccess (2016). *2016 FinAccess Household Survey*, Central Bank of Kenya, February.
4. Gubler, Z. J. (2011). "The Financial Innovation Process: Theory and Application". *Delaware Journal of Corporate Law*, 36(1).
5. Hosmer, D.W., Lemeshow, S. & Sturdivant, R. (2013). *Applied Logistic Regression*. New Jersey: John Wiley & Sons Inc.
6. Kimotho, M. & Muturi, W. (2019). "Effect of Innovations on Financial Performance of Microfinance Institutions in Kenya". *International Journal of Social Sciences and Information Technology*, 5(3), pp. 1-14.
7. Marsden, P.V. & Wright, J.D. (2010). *Handbook of Survey Research*. 2nd ed. United Kingdom: Emerald Group Publishing Limited.
8. Moki, N.M., Ndung'u, S.K. & Kinyua, G.M. (2019). "Financial Innovation Strategy and Financial Performance of Deposit Taking Saccos in Nairobi City County". *International Academic Journal of Economics and Finance*, 3(3), pp. 398-417.
9. Mugo, D.M., Muathe, S.M. & Waithaka, S.T. (2018). "Effect of Mobile Communication Services on Performance of Saccos in Kenya". *European Scientific Journal*, 14(30), pp. 46-62.

10. Ndwiga, P.M. & Maina, J.N. (2018). "Financial Innovation as an Alternative Delivery Channel and Financial Performance of Listed Commercial Banks in Kenya". *European Journal of Business and Management*, 10(17), pp. 65-69.
11. Njenga, S.M., Kiragu, D. & Opiyo, H.O. (2015). "Influence of Financial Innovations on Financial Performance of SACCOs in Nyeri County". *European Journal of Business and Social Sciences*, September, 4(6), pp. 88-99.
12. Njoroge, P., Chege, Z.M. & Ferrand, D. (2019). *2019 FinAccess Household Survey*, Nairobi: FinAccess.
13. O'Connell, A.A. (2006). *Logistic Regression Models for Ordinal Response Variables*. California-USA: SAGE Publication Inc.
14. Omilola, B. & Lerven, F.V. (2019). *Accelerating Poverty and Hunger Reduction in Africa: Progress and Policy Prescriptions*, New York: UNDP.
15. Onwonga, M.M. (2016). *Effect of Cash Handling Practices on Financial Performance of Commercial Banks in Kenya*, Nairobi: United States International University-Africa.
16. Opalo, J.A. (2014). *Effect of Financial Stability on the Performance of Deposit Taking Saccos in Nairobi County*, Nairobi: University of Nairobi.
17. SASRA (2017). *The SACCO Supervision Annual Report, 2017*, Nairobi: SASRA.
18. SASRA (2018). *The Sacco Supervision Annual Report*, Nairobi: Sacco Society Regulatory Authority (SASRA).
19. Sebhatu, K.T. (2012). "Management of Savings and Credit Cooperatives from the Perspective of Outreach and Sustainability: Evidence from Southern Tigray of Ethiopia". *Research Journal of Finance and Accounting*, 2(7), pp. 10-24.
20. Simiyu, M.N. & Olweny, T. (2018). "Effect of Financial Innovation on Financial Performance: A Case Study of Deposit-Taking Savings and Credit Co-operative Societies in Kajiado County". *International Journal of Social Sciences and Information Technology*, 4(5), pp. 370-389.
21. Sum, R. & Memba, F. (2016). "The Effect of Financial Innovation on the Financial Performance of Deposit Taking SACCOs in Kenya, A Case of Kiambu County". *International Journal of Social Sciences and Information Technology*, June.2(4).

22. Tsuma, R.S., Musiega, G.M., Odhiambo, A. & Musiega, D. (2015). "Effects of Financial Innovations on Financial Performance of SACCOs in Kenya: A case of Kakamega Teachers Co-operative Society Limited". *International Journal of Business and Management Invention*, June.4(6).
23. Tumwine, F., Mbabazize, M. & Shukla, J. (2015). "Savings and Credit Cooperatives (Sacco's) Services' Terms and Members' EconomicDevelopment in Rwanda: A Case Study of Zigama Sacco Ltd". *International Journal of Community and Cooperative Studies*, 3(2), pp. 1-56.
24. WOCCU (2018). *World Council Statistical Report 2018*, Washington DC. USA: World Council of Credit Unions.
25. Yang, K. & Miller, G.J. (2008). *Handbook of Research Methods in Public Administration*. New York : CRC Press.