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Effect of Internet Banking Technology on Loan Performance of Deposit-Taking SACCOs in Mombasa County, Kenya

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Abstract:

Financial institutions are now able to become more efficient while also putting the needs of the client first, thanks to technological advancements in the digital financial sector. By focusing on determining the impact of internet banking technology on loan performance in DT SACCOs in Mombasa County, this study examined the impact of digital financial innovations on the loan performance of DT SACCOs in Mombasa County. The importance of financial innovation adoption by financial services industry participants was highlighted by prior research findings. To identify the research gaps forming the basis for the study, the diffusion of innovation theory, theory, and the literature of such studies was reviewed. A descriptive research design was adopted for the study. The research sample consisted of 70 respondents drawn from the board of management and staff of the six deposit-taking SACCOs in Mombasa County. Of the 70 questionnaires, 63 were completed and returned representing 90% response rate. The findings show that the majority of respondents believe that internet banking technology (mean: 4.18) has a substantial effect on loan performance in DT SACCOs in Mombasa. The results of the regression analysis and hypothesis testing indicate that when digital financial innovations are implemented in the loaning procedures and processes, DT SACCOs' loan performance increases. The study recommends that DT SACCOs should consider internet banking technology, given that the financial sector is moving toward a digital environment if they want to improve the performance of their loan portfolio.

Keywords: Financial digital innovation, loan performance, deposit-making SACCOs

1. Introduction

1.1. Digital Financial Innovation

Digital financial innovation is the use of technology innovations in the delivery of financial services (Pazarbasioglu, Mora, Uttamchandani, Natarajan, Feyen & Saal, 2020). The past three decades have encountered digital and technological disruptions that have enabled financial institutions to reinvent their business models to provide service to customers through digital means, increase efficiency, and be more customer-focused channels simultaneously (Beck, 2020). The advancements in internet connectivity, mobile technology, cutting-edge computing techniques, data portability, artificial intelligence, and robotics are some of the technological advances that have ushered in a new era of digital financial innovations (Frame, Wall & White, 2018).

Internet (online) banking innovation makes use of the internet for the delivery of financial services (OECD, 2020). Internet banking allows customers to transact on their bank accounts using computers, mobile phones, and tablets through an online portal on their respective bank's website at their convenience without visiting the bank offices physically (Tahir, Shah, Arif, Ahmad, Aziz & Ullah, 2018). Financial institutions in Kenya have experienced increased adoption of online banking resulting in improved operational efficiency and reduced risk associated with physical transactions, with the major limitation being the initial cost of setting up the online infrastructure (Ndwigwa & Maina, 2018).

The rapid speed at which technological systems keep changing, coupled with rapid internet penetration, has forced many financial institutions, including SACCOs, to rethink their customer attraction and retention strategies in terms of service delivery. By ensuring quality banking services are provided to the customers' convenience at minimal cost, online banking technology has enabled institutions to enhance their members' experience and expand their base, especially with the millennial population (Jepchumba & Simiyu, 2019; Abbasi, Kamran & Akhtar, 2017). The adoption of

online banking technology has its inherent risks and challenges, such as internet downtime, security of internet channels, and breach of customer privacy through cyber-attacks (Abdou, Hadjiantoni & Derwin, 2015). The recent past has witnessed an increase in security and privacy risks to both customers and banks. Unauthorized system access has resulted in fraudulent activities such as customer accounts manipulation, data theft, and virus attacks that erode customer trust (Abbasi, Kamran & Akhtar, 2017). Besides installing robust online banking security systems, financial institutions need to educate their customers on how inappropriate internet behavior can lead to online fraud exposure (Ameme & Yeboah-Boateng, 2016).

1.2. Loan Performance

Investment in loans is one of the core businesses of SACCOs, making loan performance key to the liquidity and profitability of SACCOs. According to Nsengiyumva and Harelimana (2020), "Loan performance is a measure of whether loans are settled in full according to the loan contract or not." It is an integral factor in the financial stability of any financial institution engaging in the provision of loans. When the agreed instalments and interests are paid as scheduled, the loan is said to be performing. However, there is always the risk that members will not be able to repay as per the contract. When this occurs, the loans are classified as 'non-performing,' which weakens the profitability of SACCO. The financial crisis of 2008, which led to high levels of non-performing loans across the globe, exposed the deficiencies in loan performance management practices and the banking industry's failure to notice and act promptly. (Nguyen, Dao, Hussain, 2020; Bauze, 2019). Non-performing loans (NPLs) reduce the amount of money available for the provision of new loans as well as deny the SACCO revenue in the form of interest (Mensa, 2015). He further emphasizes the importance of performing loans to the growth of financial institutions and links it to the lending capacity, liquidity, and overall institution profitability. Inadequate or poor appraisal processes by SACCOs lead to poor client selection, and inadequate loan monitoring mechanisms have been found to be among the main contributors to loan default (Samoei, Kiprotich, Nambuswa & Namusonge, 2015). Various studies show that digital financial innovations in financial co-operatives conclude that digital financial innovations reduce the risk of onboarding risky borrowers (Arner, Auer & Frost, 2020), reduce risks associated with handling cash, such as loss and fraud while also saving time and resources (D'Silva, Filková, Packer & Tiwari, 2019), reduce transactions and decision making turnaround time (Feyen, Heffernan, Natarajan, Saal & Sarkar, 2021) and lead to increased liquidity and profitability (Goldfarb & Tucker, 2019). In their study on mobile money innovation and the financial performance of financial institutions, Memba and Sum (2016) concluded that the adoption of mobile money innovation increased loan performance by reducing default rates and consequently reduced the risk posed by NPLs.

1.3. Statement of the Problem

In the past ten years, many SACCOs in Kenya have embraced the use of digital financial innovations in their operations in a bid to stay up with the increasing competition in the financial services sector. Existing studies have sought to ascertain how financial innovations have impacted the SACCOs sector (Tsuma, 2015; Nderitu, Muthii & Ngina, 2020; Moki, Ndungu & Kinyua, 2019; Tahir, Said, Arif, Gulzar & Ullah, 2018; Agufa, 2016; Aoko, 2017; Jeruto, 2020). The studies generally conclude that if digital financial innovations are well-implemented, SACCOs will experience improved service delivery, liquidity, and profitability leading to improved financial performance. Despite such heavy investments in digital financial innovations, many SACCOs are still grappling with a high number of non-performing loan ratios that are way above the standard of 5% of the total loan book, as recommended by SASRA. According to SASRA supervisory report (2020), in the last 5 years, there has been a steady rise in NPL rate for DT SACCOs above the standard 5% as follows: 5.12% (2015), 5.23% (2016), 6.14 (2017), 6.30% (2018), 6.15% (2019) and 8.39% (2020). Quite often than usual, high loan delinquency rate results in non-performing loans which increases liquidity problems that cause SACCOs to fail in delivering on their promises (Jeruto, 2020). Given that investment in loans is one of the core businesses of SACCOs, the performance of such loans is key to the organization's liquidity and profitability, and a rise in NPLs is symbolic of poor loan performance.

It is noted that existing studies on digital financial innovations have mainly focused on financial performance as a dependent variable (Wamugo, 2018; Nekesa & Olweny, 2018; Njenga, Kiragu & Opiyo, 2015; Mwangi, 2018; Mugo, Muathe & Waithaka, 2018), and hardly any evidence on loan performance as a dependent variable. This study differs from others because it aims to ascertain how digital financial technologies have an impact on loan performance. Specifically, the study aims to determine whether mobile banking technology, process digitalization, application programming interface, and internet banking technology innovations affect the loan performance of DT SACCOs in Mombasa County.

1.4. General Objective

The general objective of the study is to determine the effect of internet banking technology on loan performance in DT SACCOs in Mombasa County.

1.5. Research Hypothesis

- H01: Internet banking technology has no significant effect on loan performance of DT SACCOs in Mombasa.

2. Literature Review

2.1. Theory of Asymmetric Information

First presented in the 1970s, the theory of Asymmetric information posits the existence of information asymmetry when one party is more informed than the other to gain an undue advantage (Ogunsanwo, Abdulai & Abere, 2020). The asymmetric information in DT SACCOs arises when a member applies for a loan but is reluctant to disclose all the relevant information that would affect the decision on whether to approve the loan or not (Chege, Olweny & Opuodho, 2018). This results in DT SACCOs encountering problems associated with members using the funds for reasons other than what was disclosed on the application form (moral hazard) or making erroneous loan approval decisions (adverse selection). The SACCO sector statistics indicate a high number of defaulted loans, an indicator of poor loan performance because of the problems of moral hazard and adverse selection. To overcome this DT SACCOs are leveraging the information they have on the members and customers to determine the creditworthiness of the prospective borrowers as well as adopting the use of technology to access third-party databases to assist in the decision-making of loan approvals (Gachora, 2015). The theory of Asymmetric information is essential for this study because it will provide insight into how the use of digital innovations can reduce the effects of lack of information in the loan performance process of DT SACCOs (Chantal, Namusonge, & Shukla, 2018).

2.2. Empirical Review

Internet (online) banking innovation makes use of the internet for the delivery of financial services (OECD, 2020). Thanks to Internet banking, customers can transact on their bank accounts using computers, mobile phones, and tablets through an online portal on their respective bank's website at their convenience without visiting the bank offices physically (Tahir, Shah, Arif, Ahmad, Aziz & Ullah, 2018). Financial institutions in Kenya have experienced increased adoption of online banking resulting in improved operational efficiency and reduced risk associated with physical transactions, with the major limitation being the initial cost of setting up the online infrastructure (Ndwiga & Maina, 2018). The rapid speed at which technological systems keep changing, coupled with rapid internet penetration, has forced many financial institutions, including SACCOs, to rethink their customer attraction and retention strategies in terms of service delivery (Otundo, 2019). By ensuring quality banking services are provided to the customers' convenience at minimal cost, online banking technology has enabled institutions to enhance their members' experience and expand their base, especially with the millennial population (Jepchumba & Simiyu, 2019; Abbasi, Kamran & Akhtar, 2017).

The adoption of online banking technology has its inherent risks and challenges, such as internet downtime, security of internet channels, and breach of customer privacy through cyber-attacks (Abdou, Hadjiantoni & Derwin, 2015). The recent past has witnessed an increase in security and privacy risks to both customers and banks. Unauthorized system access has resulted in fraudulent activities such as customer accounts manipulation, data theft, and virus attacks that erode customers' trust (Abbasi, Kamran & Akhtar, 2017). Besides installing robust online banking security systems, financial institutions need to educate their customers on how inappropriate internet behavior can lead to online fraud exposure (Ameme & Yeboah-Boateng, 2016).

2.3. Conceptual Framework

A Conceptual framework provides a visual analysis of the relationship between the independent and dependent variables of the study. This study will make use of the Disruptive Innovation Theory (DI) to explain the effect of the independent variable on the dependent variable in DT SACCOs in Mombasa County.

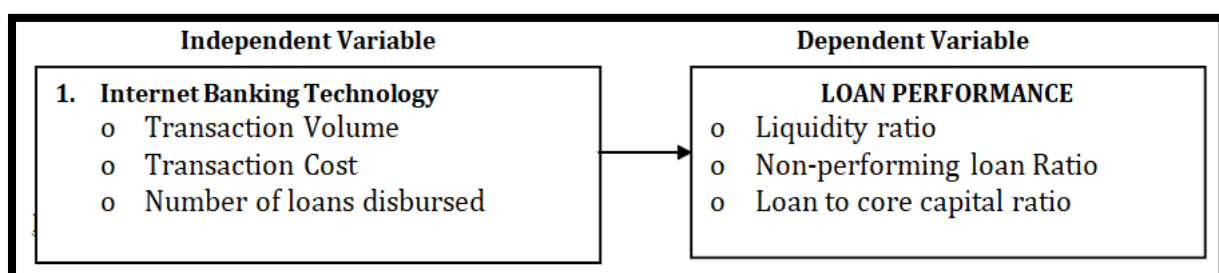


Figure 1: Conceptual Framework

3. Methodology

The study adopted a descriptive research design to measure the effect of digital financial innovations on loan performance. Descriptive statistics were used to describe characteristics (outcomes, patterns, and trends) of subjects under the study by use of central tendencies, mean, and standard deviations while pie charts, graphs, tables, and cross-tabulations were used to present outcomes. Inferential statistics were used in the study to conclude the general population based on the observations from the descriptive statistics. The target population for the study was 190, which represented all members of the Board and staff of all the six DT SACCOs in Mombasa County as licensed by SASRA (SASRA, 2020; Priyono, 2017).

The researcher utilized a stratified random sampling technique to determine respondents for interviews. After acquiring a list of the six (6) SASRA-accredited DT SACCOs in Mombasa County, the researcher divided the population of

each SACCO into two groups: The Board of Management and the SACCO employees as primary strata. This was necessary for better data collection, management, and interpretation. Stratified random sampling yields high statistical accuracy for both larger and smaller sample sizes and enables the retrieval of useful research results. It also affords total control of each strata division by the researcher (Orangi, 2019). A sample size of 70 respondents was determined using the Nassiuma formula (Nassiuma, 2008 as cited by Orangi, 2019), which posits that the range of $21\% \leq C \leq 30\%$ for a coefficient of variation and $2\% \leq e \leq 5\%$ for standard variation is acceptable in most surveys.

$$n = NC^2 / (C^2 + (N-1) e^2)$$

Where:

- n = Sample size
- N = Accessible population
- C = Coefficient of Variance in the range of $21\% \leq C \leq 30\%$
- e = Standard error in the range of $2\% \leq e \leq 5\%$

Questionnaires were used to collect data from primary sources, while secondary data were acquired from records, journals, annual reports, financial statements, and websites for review and analysis. The Lawshe formula was used to test the content validity of the research instrument. Content validity is the appropriateness of measures of an instrument for research. It speaks to how the measures (responses, observation logs, questions, etc.) accurately estimate what you want to gauge. That is, the degree to which measurement encompasses all aspects of the concept being measured (Daud, Khidzir, Ismail & Abdullah, 2018). Content validity index values above the commonly acceptable critical value of 0.778 for a panel of 9 are considered acceptable (Nikolopoulou, 2022). The researcher obtained a content validity index of 0.882 and, therefore, concluded that the research instrument was accurately measuring what it was intended to.

The reliability of the questionnaire was tested using Cronbach's Alpha Index. Reliability is the extent to which the questionnaire yields the same results all the time. It speaks to the consistency of a quantifying instrument providing the same measurements when measures are retaken using the same items and procedures all the time (Architha & Aithal, 2020). To calculate the Cronbach Alpha Index, a pilot test study of a total of 10 questionnaires was administered. The examination of the variables yielded Cronbach's alpha scores of 0.98 for Internet banking technology. Variables with a Cronbach's alpha score of 0.7 or more are said to be valid and reliable (Taber, 2017).

Multiple Linear Regression analysis is used to establish the correlations between variables and sub-variables. The multiple regression analysis model is indicated below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where:

- Y = Loan Performance
- β_0 = Intercept (Constant)
- $\beta_1 - \beta_4$ = Coefficients
- X_1 = Internet Banking Technology
- ε = Probable Error Term

Hypothesis testing was performed to test the implication of relationships that existed between the study variables. The study was guided by a null hypothesis that was tested using the z-test at a five (5) percent significance level. The null hypothesis was rejected if $\mu_1 \neq 0$ and the p-value is less or equal to 0.05.

4. Results

A total of 70 questionnaires were sent by the researcher to the respondents. Of the 70 respondents, 63 completed and returned the questionnaires, representing 90%, while 7 respondents declined to fill out the questionnaire. According to Mugenda and Mugenda (2003), as cited by Mwanja and Murithi (2017), a response rate of 50% is satisfactory for a study, 60% is worthy, and 70% and beyond is excellent. Therefore, a response rate of 90% was considered excellent for the study.

Number Of Questionnaires Issued	Number of Questionnaires Validly Completed	Percentage
70	63	90.0%

Table 1: Response Rate

4.1. Descriptive Statistics on the Effect of Internet Banking Technology on Loan Performance

The researcher sought to determine the effect of internet banking technology on loan performance by analyzing the respondents' ratings of the sub-criteria under the parameters of transaction volume, transaction cost, and the number of loans disbursed via internet banking innovation. A Likert scale of 1 (very low), 2 (low), 3 (average), 4 (high), and 5 (very high) was used. The table below shows the details of the results.

Category	VL	L	A	H	VH	Mean	Std Dev.
	(%)	(%)	(%)	(%)	(%)		
Transaction Volume							
Number of loan repayments deposits	0	0	11.1	63.5	25.4	4.14	0.587
Number of loan withdrawals	0	1.6	1.6	38.1	58.7	4.54	0.613
Transaction Cost							
Cost of Internet banking	3.2	3.2	20.6	47.6	25.4	3.89	0.928
Loan Disbursement							
Number of loans disbursed	0	1.6	14.3	54	30.2	4.13	0.701
Aggregate mean and standard deviation						4.18	0.707

Table 2: Effect of Internet Banking Technology on Loan Performance in DT SACCOs

The analysis of the results in table 2 above indicates that the respondents noted that the number of loan repayments through internet banking technology was high (63.5%) and very high (25.4%). Only 11.1% cited an average number of loan repayments. On loan withdrawals via internet banking technology, the respondents responded as follows: 58.7% very high, 38.1% high, 1.6% average, and a further 1.6% low. Respondents estimated the cost of internet banking transactions as very low (3.2%), low (3.2%), average (20.6%), high (47.6%), and very high (25.4%). The majority of the respondents believe that the use of internet banking technology to disburse loans is high, as rated by 54.0% of the respondents, with the rest responding as follows: low (1.6%), average (14.3%), and very high (30.2%).

The aggregate mean of 4.18 and the standard deviation of 0.707 show that the majority of the respondents agree with the fact that Internet banking technology has a significant effect on the loan performance of DT SACCOs. In addition, there was no significant variation in the responses provided by the respondents. The results are similar to those of the study on internet banking by Mateka, Gogo, and Omagwa (2016), which revealed that financial institutions have been able to post increases in their loan books, resulting in more loan disbursements and interest income. Similarly, Kihara (2015) contends that customers can do a lot more with internet banking, such as transferring funds between accounts, paying bills, requesting or viewing statements online, viewing their investment portfolios, and even buying and selling securities.

Multiple regression analysis was conducted to determine the relationship between loan performance and internet banking technology.

Model	Unstandardized Coefficients		Standardized Coefficients	
	B	Std. Error		Beta
(Constant)	1.645	.322		4.959
Internet Banking Technology	.137	.068	.183	2.002

Table 3: Regression Coefficient

a. Dependent Variable: Loan Performance of DT SACCOs in Mombasa County

The findings show that mobile banking technology has a positive and significant impact on the loan performance of DT SACCOs in Mombasa County with regression coefficients of $\beta = 0.137$. The data reveals that a unit increase in mobile banking technology will lead to a 0.137 unit increase in loan performance of DT SACCOs in Mombasa County.

4.2. Hypothesis Testing

The study utilized the Z-test to test the null hypotheses of the objective. Internet banking technology was estimated against loan performance at a 5% significance level to draw conclusions.

Hypothesis Statement	Sig.	Decision Rule
H₀₁ : Internet banking technology has no significant effect on loan performance of DT SACCOs in Mombasa.	0.001	Null hypothesis rejected

Table 4: Summary of Hypotheses Results

4.3. Interpretation of Research Findings

Internet banking technology was one of the objectives studied to determine how it affects loan performance at DT SACCOs. The majority of respondents asserted that the number of loans being applied for, approved, and repaid online had increased significantly. The results are similar to those of the study on internet banking by Mateka, Gogo, and Omagwa (2016), which revealed that financial institutions have been able to post increases in their loan books, resulting in more loan disbursements and interest income. Similarly, Kihara (2015) contends that customers can do a lot more with internet banking, such as transferring funds between accounts, paying bills, requesting or viewing statements online, viewing their investment portfolios, and even buying and selling securities. Focusing on DT SACCOs in Mombasa County, this chapter examined data and conclusions regarding the effect of digital financial innovations among deposit-taking SACCOs. The 70 surveys that were issued received an overall response rate of 90.0%. The loan performance of DTS in Mombasa County was found to be statistically and significantly correlated with process digitalization, mobile banking technology, APIs, and internet banking technology.

5. Summary, Conclusions, and Recommendations

Transaction volume, number of loans disbursed, and transaction cost were the three dimensions used to categorize mobile banking technology. The highest mean was found in the transaction volume, followed by the number of loans disbursed, and lastly, the transaction cost dimensions. The alternative hypothesis (H4) that Internet banking technology significantly affects the loan performance of DT SACCOs in Mombasa County was accepted as a result of the study's findings, which demonstrated a positive correlation and statistical significance between Internet banking technology and loan performance at DT SACCOs in Mombasa ($z = -3.2997$; $p = 0.0010.05$).

The findings indicate that the introduction of internet banking technology in DT SACCOs has resulted in an increased number of loans applied for and processed and a reduction in loan defaults due to increased loan repayment convenience through the internet. The study also concludes that the performance of DT SACCO's loan portfolio would be negatively and considerably impacted by online banking costs and commissions and that an increase in these fees and charges would have the same effect.

Despite favorable reviews, there are still a number of security risks with online banking services. Customers' awareness of the risks associated with using free internet services should be increased through education and training. Financial services that may be quickly accessed online should be developed and brought to members' attention.

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