Digital Transformation: A Study of how SACCO Members in Kenya Experience Financial Inclusion through Digital Financial Services

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Abstract

Financial inclusion has gained prominence as a critical element for sustainable development and inclusive growth. Saving and Credit Cooperative Societies (SACCOs) in Kenya play a vital role in providing financial services to their members, particularly those who are underserved by traditional banking institutions. However, limited access to financial services remains a significant challenge. This conference paper investigates how the adoption of digital financial services influences financial inclusion among members of saving and credit cooperative societies in Kenya. Survey data were collected from 334 randomly selected SACCO members. This study employed probit regression analysis to assess the hypotheses developed. The findings of the research support the hypothesis that the adoption of digital financial services positively influences financial inclusion among SACCO members. The analysis revealed that the implementation of digital financial services (DFSs) has significantly expanded financial access for previously underserved populations. Members now have convenient and efficient channels to save, borrow, and manage their finances, leading to increased economic empowerment and reduced inequalities. Moreover, the adoption of digital financial services has streamlined SACCO operations, improving efficiency, transparency, and accountability. This has aided SACCOs in serving their members' financial needs more effectively.

Key words

digital financial services, financial inclusion, SACCOs, credit unions.

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Introduction

The World Bank reports of 2018, 2022, define financial inclusion as the accessibility and availability of financial services to all individuals, especially those who have been historically excluded or underserved. It encompasses access to a range of digital financial services, including mobile money services,

payment cards, and other financial technology (or fintech) applications (Demirgüç-Kunt et al., 2018; Demirgüç-Kunt et al., 2022). Financial inclusion is considered crucial for economic development, a spotlight for economic policy making (Nguyen, 2021), and thus plays a significant role in promoting inclusive growth and reducing poverty (Ezzahid & Elouaourti, 2022). According to the World Bank's 2020 report, 65% of adults in the world's poorest economies lack access to even the most basic transaction account, which would allow them to send and receive payments more safely and efficiently. Only 20% of adults in developing economies save through formal financial institutions. The remaining savers use less formal and more costly methods (Pazarbasioglu et al., 2020). Access to financial institutions is often difficult for underserved populations, particularly those living in remote or rural areas. These financial institutions frequently overlook or underestimate the unique financial needs of underserved populations, such as microenterprises and smallholder farmers, limiting their ability to access suitable financial services (Gupta, 2022). Traditional financial institutions frequently charge high transaction fees, have minimum balance requirements, and have complicated account opening processes, which discourages underserved people from using their services. Financial services can be unaffordable, especially for people with low incomes or irregular cash flows (Misati et al., 2022). Underserved populations, especially women, may face barriers to accessing financial services due to sociocultural norms, traditions, and gender inequalities. Discrimination limits decision-making power, and restricted mobility can impede women's ability to open bank accounts or access loans (Were et al., 2021). Research on savings and credit cooperative societies (SACCOs) in Kenya has predominantly concentrated on examining the connection between digital financial services and financial inclusion, with a particular emphasis on its impact on overall financial performance. Moki et al. (2019) found that financial innovation significantly increased the financial performance of SACCOs. Hemed (2022) focused on how financial inclusion strategies affect how deposit-taking SACCOs in Kenya perform financially. Ogindo and Njoka (2023) aimed to examine how digital transformation affects the financial performance of Nairobi-based SACCOs. The FinAccess (2021) survey conducted in Kenya highlighted challenges faced by members of Saving and Credit Cooperative Societies (SACCOs) in accessing digital financial services (DFS), consequently affecting their access to SACCO products. The current study aims to investigate how the adoption of digital financial services influences financial inclusion among members of saving and credit cooperative societies in Kenya. Specifically, the hypothesis posits that the adoption of digital financial services will enhance financial inclusion within SACCOs, leading to improved access to financial services, economic empowerment, and overall well-being for members.

The rest of the article is divided into the following sections. Section 1 reviews the literature. The approach used is explained in Section 2. The results are presented in Section 3, and the main subject is discussed in Section 4. The paper's conclusions are included in Section 5, and references are given in Section 6.

1. Literature review

1.1 Saving and Credit Cooperative Societies (SACCOs)

Savings and credit cooperatives are also referred to as financial cooperatives or credit unions (Mckillop & Wilson, 2011). SACCOs serve as localized, member-owned financial cooperatives that play a significant role in expanding access to financial services, particularly in areas where traditional banking infrastructure may be limited (McKillop et al., 2020). Kenya experienced a series of bank

collapses in the 1990s, which led to the SACCO sector becoming the fastest-growing subsector of cooperatives in Kenya, making it a regional leader in Africa (Mathuva & Kiweu, 2016; Ototo, 2017). SACCOs are a subcategory of cooperatives in Kenya with the purpose of advancing credit or other lending facilities to SACCO members and mobilizing savings from members (SASRA, 2021). SACCO members are frequently motivated to promote socioeconomic benefits through their organization's lending activities, both for their fellow savers and borrowers and for the larger community (Feather and Meme, 2019). SACCOs are categorized into two types: deposit-taking SACCOs (DT-SACCOs) and non-deposit-taking SACCOs (non-DT-SACCOs). In their 2020 Sacco Supervision Annual Report 2020, the Sacco Societies Regulatory Authority (SASRA) declared that SACCOs must fully embrace the usage of ICT and other technologically enabled mobile devices in their operations and service provision (SASRA, 2021). The Sacco Societies Regulatory Authority (SASRA) is the authority that regulates and supervises the activities of qualifying SACCOs. The World Bank (2020) reported how developing economies benefit from digital financial services, increasing access to these services and making them critical for poverty reduction and economic growth (Pazarbasioglu et al., 2020). The FinAccess Survey (FSD Kenya, 2021) also revealed that the disparity between rural and urban consumers of financial services was narrowed as a result of the adoption of mobile money and subsequent digitalization of financial services and products leading to financial inclusion.

1.2 Digital financial services

Digital financial services (DFSs) include mobile banking, online lending, digital payment platforms, and other technological advancements that allow people to perform financial transactions and gain access to a variety of financial goods from a distance (Ong et al., 2023). According to Demirgüç-Kunt et al. (2018), access to mobile money services provided significant benefits, particularly to women in Kenya. It enabled women-headed households to increase their savings by more than a fifth, allowed 185,000 women to leave farming to pursue business or retail opportunities, and contributed to a 22% reduction in extreme poverty among women-headed households.

DFSs have become much more well known in recent years and have the potential to broaden financial inclusion. By providing accessible, specialized, and community-driven digital financial services that empower people and support regional economic development, SACCOs in Kenya play a crucial role in fostering financial inclusion (Maina et al., 2020). According to the 2019 FinAccess survey, SACCOs in Kenya are more accessible and affordable than are those in other financial institutions (FSD Kenya, 2019). SACCOs design their financial products and services to cater to the specific needs of their members. This might include savings accounts, loans, insurance, and investment opportunities tailored to local economic conditions and member preferences (Frank et al., 2015). SACCOs also empower their members by offering financial education and training. This knowledge equips members with the skills to manage their finances effectively, make informed decisions, and plan for the future (Wanyonyi & Ngaba, 2021). The theoretical framework for this study was based on Davis's (1989) technology acceptance model (TAM). TAM proposes that a person's acceptance of a technology is determined by his or her voluntary intention to use it. Intention, in turn, is determined by the person's attitude toward using that technology and his or her perception of its usefulness (Davis, 1989). This study aimed to contribute to the literature by investigating the extent to which the adoption of digital financial services within SACCOs fostered the financial inclusion of their members.

1.3 Financial Inclusion

Financial inclusion refers to the accessibility and availability of financial services to all individuals, especially those who have been historically excluded or underserved (Demirgüç-Kunt et al., 2022). Government restrictions due to the COVID-19 pandemic led to a change in the way business was performed, especially in financial services. In Kenya, the government-imposed restrictions on physical contact, which led to the SACCO regulator SASRA to encourage SACCOs to adopt cashless transactions via digital payment channels such as ATMs, POS terminals, online, mobile or smartphones, and card networks (SASRA, 2021). These orders resulted in an exponential increase in DFS, which has since been maintained in the postpandemic period. (Mhlanga & Dzingirai, 2023). According to the World Bank (2021), the adoption of DFS by SACCOs and other financial institutions experienced rapid growth in digital financial inclusion after the 2020 period. Technological advances such as FinTech, the digitalization of products and services and online provision continue to shape the business model of co-operative financial institutions (McKillop et al. 2020). The emergence of DFS has led to a shift in focus from the products and services delivered to those that deliver products and services (Arner et al., 2017a; 2017b). DFSs are primarily used by SACCOs to provide credit, deposits, and access to other cooperative services (e.g., credit cards, queries, and special savings) (Westermeier, 2018). However, the FinAccess (2021) survey in Kenya revealed difficulties for SACCO members in accessing DFS and, as a result, SACCO products. These challenges lead to the following hypothesis:

HI: The adoption of digital financial services will positively influence the financial inclusion of SACCO members.

2. Methodology

This study employed a quantitative approach to investigate how the adoption of digital financial services influences financial inclusion among SACCOs members in Kenya. The SACCO members were from both DT-SACCOs and Non-WDT-SACCOs, licenced and authorized SACCOs in Kenya. Because there are over 10,000 SACCO members in Kenya, a sample of 384 SACCO members was randomly chosen with a 95% confidence level (Mugenda and Mugenda, 2003). Primary data were collected through online surveys and self-administered questionnaires. Secondary data were collected from publications from the Central Bank of Kenya and from FinAccess household surveys. Self-administered questionnaires were randomly distributed and distributed in two ways: SACCO members who were employees of the SACCOs preferred drops and picks in the SACCO offices, and for members visiting the SACCO for services, this was conducted face to face. Stockemer et al. (2019) indicated that the researcher is able to observe nonverbal behaviour, draw conclusions and respond to respondents who will not understand the content of questions and explain them in more detail. Some of the questionnaires had to be translated from English to Swahili (the local language) upon request from the SACCO members who were not conversant with some financial terms. Online surveys were conducted by sharing the online link with SACCO officials who were requested to complete the survey and share the link to their SACCO members. There were 27 online surveys completed, and 307 self-administered questionnaires were collected. This translated to a total of 334 surveys for the study, which represented an 87% response rate from the targeted sample. The response rate was considered adequate, as supported by Cele (2022), who considered a 39% response rate adequate. The data are therefore representative of SACCO members in Kenya. Sixty-six percent of the respondents were from DT-SACCOs, while 34% were from Non-WDT-SACCOs, which shows that both categories of SACCOs in Kenya were well represented. As noted by Mathuva (2016), DT-SACCOs control 82% of total

membership in the sector; thus, their representation is adequate in the sample. The survey assessed members' access to digital financial services, frequency of tracking transactions, perceived impact on their financial activities and control variables, which included demographics. Financial inclusion was measured using users' indicators proposed by the World Bank (Demirgüç-Kunt et al., 2022). The study required binary responses, where individuals were categorized as either being financially included or not, and a probit regression model was therefore suitable for analysis (Wooldridge, 2018). The probit model was estimated using STATA statistical software. The probit model is specified as follows:

$$Pr(Y_i = 1) = \Phi(\beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \ldots + \beta_k X_{ki} + \varepsilon_i \quad (1)$$

where: Y_i represents the binary dependent variable indicating financial inclusion for SACCO member; Φ – the cumulative distribution function of the standard normal distribution; $X_{1i} \ldots X_{ki}$ – the independent variables related to digital financial service adoption, demographic characteristics, and other relevant factors for SACCO members; $\beta_0 \ldots \beta_k$ – the coefficients to be estimated; ε_i – the error term.

3. Research results

Table 1 represents the variable definitions based on the model.

Table 1. Variable definitions

Variable	Variable type	Description	Measurement
Dependent variable			
Financial_inclusion	Binary		= 1: "financially_included", 0: "not_financially_included"
Test variables			
DFS_Access	Binary	Access to digital financial services	= 1: increased access, 0: limited or no access
DFS_Benefits	Categorical	Benefits of DFS in terms of increasing security, convenience, transparency	= DFS increases security, convenience, transparency; Likert scale 1: "not at all" to 5: "to a great extent"
Control variables			
Age	Continuous	Age of the SACCO member	= Number of years from birthdate
Gender	Binary	Gender of the respondent	= 1: female, 0: male
Marital_Status	Categorical	Marital status of the respondent	=1: divorced, 2: married, 3: separated, 4: single, 5: widowed
Education	Categorical	Education level of the member	= 1: high school, 2: diploma, 3: bachelors degree, 4: masters degree, 5: doctorate
Income	Categorical	Income level of the respondent	= 1: below Kshs. 10,000, 2: 10,001-20,000, 3: 20,001-30,000, 4: 30,001-40,000, 5: 40,001-50,000, 6: 50,001 and above
Tracking_savings_regulary	Categorical	The type of employment the member is in	=1: part time, 2: full time, 3: self, 4: student, 5: unemployed
Fin_Literacy	Binary	A measure of the extent of a member's financial literacy	= A score derived using a nine-question test administered to respondents: 1: denotes a high score (100%), 0: denotes any score below 100%
House_Location	Categorical	The location of the respondent's household	= 1: rural, 2: semiurban, 3: urban
SACCO_Category	Binary	The classification of the SACCO as per SASRA's categories	= 1: deposit-taking SACCO; 0: nonwithdrawable deposit taking SACCO
Member_Code (ρi)	N/a	Heterogeneity in the various members responding to the survey	= a unique code to capture the different respondents
SACCO_Code (φi)	N/a	Heterogeneity in the 74 SACCOs in the sample	= a unique code to capture the different SACCOs.

Source: developed by the authors.

Table 2 presents descriptive statistics on the variables in the study. According to the results, 87.43% of the respondents were financially included due to DFS. Overall, 92.22% of the respondents indicated having access to DFS. A majority of the respondents agreed that DFS had various benefits in terms of speed (68.86%), security (59.28%) and transparency (74.85%).

Table 2. Descriptive statistics

Variable	Category 1: Freq.	Category 2: Freq.	Category 3: Freq.	Category 4: Freq.	Category 5: Freq.	Mean	St. Dev.	Min.	Max.
Dependent variables	1: "Financially included"	0: "Not financially included"							
Financial _inclusion	87.43%	12.57%				0.87	0.33		
Test variables									
	1: Increased access	0: Limited or no access							
DFS_Access	92.22%	7.78%				0.92	0.27		
	1: Not at all	2: To a small extent	3: To some extent	4: To a moderate extent	5: To a great extent				
DFS_Benefits_Speed	10.18%	7.19%	13.77%	23.65%	45.21%	3.87	1.33		
DFS_ Benefits _Security	11.68%	4.49%	24.85%	29.64%	29.34%	3.60	1.27		
DFS_ Benefits _Transparency	8.08%	6.89%	10.18%	28.44%	46.41%	3.98	1.25		
Control variables									
All binary control variables									
	1: Female	0: Male							
Gender	50.90%	49.10%				0.51	0.50		
	1: A 100% score	0: Score below 100%							
Fin_Literacy	19.46%	80.54%				0.19	0.40		
	1: DT SACCO	0: Non-WDT SACCO							
SACCO_ Category	65.87%	34.13%				1.34	0.47		
All categorical control variables									
	1:Divorced	2:Married	3:Separated	4:Single	5:Widowed				
Marital_Status	0.30%	47.60%	4.49%	47.31%	0.30%	3.00	0.99		
	1: High school	2: Diploma	3: Bachelors degree	4: Masters degree	5: Doctorate				
Education	13.17%	23.65%	51.50%	8.38%	3.29%	2.65	0.93		
	1: Below Kshs. 10,000	2: 10,001-20,000	3: 20,001-30,000	4: 30,001-40,000	5: 40,001-50,000				
Income	4.49%	10.78%	16.77%	16.47%	9.88%	4.41	1.61		
	1: Part time	2: Full time	3: Self	4: Student	5:Unemployed				
Employment Type	8.38%	73.05%	14.37%	3.59%	0.60%	2.15	0.64		
	1: Rural	2: Semiurban	3: Urban						
House_ Location	5.69%	36.53%	57.78%			2.52	0.60		
All continuous control variables									
Age (years)						34.94	8.60	19.0	62.0

Source: developed by the authors.

In terms of gender, the response rate was fairly balanced, with female respondents having a response rate slightly greater than that of their male counterparts (50.90%). This finding confirms the notion that SACCOs can be effectively utilized as vehicles for financial inclusion for all members of society in an inclusive and meaningful way (ILO, 2015). This was not the case for financial literacy levels, for which 80.54% of respondents scored below 100%, meaning that they did not answer at least one of the nine financial literacy questions correctly. The SACCO members need to be trained on the financial services offered by the SACCO to enable them to use them efficiently.

Table 3 below shows the probit regression analysis results of the relationship between the dependent variable (financial inclusion of SACCO members) and the independent variables (access to DFS by SACCO members) and the significant control variables. Some variables were excluded due to collinearity. It also shows the predictive margins representing the estimated probabilities of the outcome variables.

Table 3. Probit regression analysis results

Variables	Financial Inclusion		
	Coefficient	**Marginal Effect**	**Standard error**
Access to digital financial services	1.736***	0.916***	0.392
Financial literacy	0.015	0.878***	0.306
DFS benefits	1.522***	0.924***	0.310
Tracking savings regulary	0.807**	0.892***	0.296
Location	0.050	0.882***	0.522
SACCO category	-0.135	0.871***	0.260
Age	-0.003	0.00	0.014
Gender	0.089	0.882***	0.243
Constant	-2.047**		0.718
	* p<0.05, **p<0.01, *** p<0.001		

Source: developed by the authors.

Table 4 presents the goodness-of-fit tests and assesses whether the observed data match the expected frequencies predicted by the probit model (Pituch and Stevens, 2015). The rate of correct classification was tested by comparing the predicted category with the actual dependent variable (Cele, 2022). The performance metrics indicate that the probit model has reasonably good predictive performance, with high sensitivity and specificity. The tests showed that the model fit the data adequately for predicting the dependent variable. Some variables were excluded due to collinearity.

Table 4. Goodness-of-fit test and rate of classification

Goodness-of-fit test after probit model	**Financial Inclusion**
Pearson chi2 test	Pearson chi2(202) = 181.04; Prob > chi2 = 0.8526
McFadden's R2	0.455
Cragg & Uhler's R2:	0.546
Rate of classification	
Sensitivity	98.62%.
Specify	55.00%.
Overall classification rate	93.33%

Source: developed by the authors.

4. Discussion

The probit regression model was used to test the following hypotheses: The adoption of digital financial services will positively influence the financial inclusion of SACCO members. Table 3 reports the results of the estimation examining the influence of DFS on a SACCO member's financial inclusion. According to the results, access to digital financial services is positive and highly significant at the 1 percent level. This finding confirms our hypothesis (H1) that adoption of DFS positively influences financial inclusion among SACCOs. This finding implies that the adoption of DFS by SACCOs will increase access to financial services for their members compared to those who do not. This finding supports the TAM and the arguments of Jumena (2022), Ediagbonya et al. (2023) and Moki et al. (2019) that DFS is a necessary tool for improved financial inclusion. According to the model, SACCO members with high access to DFS are predicted to have a probability of accessing financial services of approximately 91.6%. Our findings align with the work of Ndwiga et al. (2018), who demonstrated that DFS adoption positively impacts the frequency and consistency of members' contributions. Similarly, our research resonates with that of Varlamova et al. (2020), revealing the positive impact of DFS on saving behaviours. Pazarbasioglu et al. (2020) emphasize the importance of DFS in increasing efficiency in financial service delivery while also improving the speed, transparency, security, and availability of tailored financial services that serve all consumer categories.

SACCO members in rural areas are predicted to have a probability of accessing financial services of approximately 88.2%. The predicted probability of DFS increasing security, convenience and transparency is approximately 92.4%. of accessing financial services. In their study on digital savings in emerging economies, Awosika et al. (2023) found that digital savings for unbackable people can improve their economic well-being. Ouma et al. (2017) showed that individuals who perceived an increase in the security of digital financial services were more likely to have savings. A study by Demirgüç-Kunt et al. (2022) suggested that access to digital financial services positively influences savings behaviour by providing convenience, reducing transaction costs, and increasing financial security. SACCOs also seem to remove barriers to accessing financial services for underserved populations, particularly women (Jagtiani and Lemieux, 2018). Approximately 88.2% of women in SACCOs were predicted to access financial services. This finding is consistent with the study by Bwana and Mwakujonga (2013), who reported that SACCOs generally have an equal gender and that females are well represented. According to the 2021 FinAccess Household Survey, gender disparities in access to digital financial services have narrowed over time, allowing females to participate more meaningfully in formal economic activities (FSD Kenya, 2021).

Conclusions

In conclusion, the study reveals a significant positive correlation between the adoption of digital financial services and increased financial inclusion among SACCO members. Members who engage with digital platforms showcase improved access to formal financial activities, including savings, credit, and payments. By offering digital services, SACCOs can expand their reach beyond their immediate geographical area. Members who may live far from a physical branch can access services digitally, broadening the SACCO's member base. Digital financial services also contributed to the operational sustainability of SACCOs. By reducing manual processes and increasing efficiency, SACCOs can allocate resources more effectively and manage costs, ensuring their long-term viability. However, the SACCO needs to train its members on the DFS and their uses and benefits.

In the era where technology is the conduit for reshaping societal landscapes, our findings reinforce the assertion that digital transformation is not only a pathway but also a catalyst for financial inclusion. By breaking down the barriers of geography, gender, and limited access, digital financial services empower individuals to harness economic opportunities previously beyond their reach. Policy makers should create a regulatory framework that supports digital financial innovation while ensuring consumer protection, data security, and privacy. This framework should encourage innovation while maintaining a level playing field.

Future research and collaboration are essential for advancing the field of digital financial inclusion and sustainable development. Researchers could explore the application of behavioural economics principles in designing digital financial services that encourage positive financial behaviours. Investigations on the long-term impact of digital financial inclusion on various socioeconomic indicators, such as poverty reduction, income distribution, and job creation, could also be considered.

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