

The Contribution of Activity-Based Costing on the Increase of Membership Savings Among the Tanzanian Savings and Credit Co-operative Societies

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Abstract

The aim of this study was to assess the contribution of activity-based costing (ABC) on the increase of membership savings among the savings and credit co-operative societies (SACCOS) in Tanzania. ABC system was initially applied to determine the lowest interest rate on loans offered by SACCOS while ensuring the financial sustainability of these microfinance institutions (MFIs) in the country. Furthermore, the study examined the causal relationship between the interest rate specifically referencing the computed rate and the amount of membership savings, which play a significant role in SACCOS' capital structure. The data collection exercise employed a cross-sectional survey design and a desk review approach, utilizing both primary and secondary sources from 192 SACCOS operating in the regions of Dar es Salaam, Arusha, and Dodoma. Both primary and secondary data were analyzed using the simultaneous equation model (SEM). The first phase of the model, in which the ABC system was applied, revealed that SACCOS in Tanzania could remain financially sustainable even with a single-digit interest rate as low as 4.57% per annum. The second phase, which utilized the binary logistic regression model, indicated that the transition to a single-digit interest rate was a key driver of increased savings, which is essential for reducing the financial leverage of SACCOS.

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Key words: Activity-based Costing Applications; Loan Interest Rate; Savings Increase; Capital Structure; Financial Leverage

Introduction

Savings and credit cooperative societies (SACCOS) are among the microfinance institutions (MFIs) that have emerged as alternative sources of credit for

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marginalized communities in Tanzania (Preethi, 2023; Towo, 2022). These institutions serve as pools of savings mobilized from members, which are then offered as credit in return (Twumasi et al., 2020). A study by Nyamsogoro (2010) specifically identified savings as the engine driving the financial sustainability of MFIs in Tanzania, among other factors. This argument was supported by Zibusiso (2020), who reported that low savings were the primary cause of poor liquidity among MFIs, leading many to cease operations. However, the issue of limited savings mobilization by SACCOS was not comprehensively addressed, as most previous studies focused on external factors affecting the process. These factors include savings knowledge, interest rates on savings, legal and procedural matters, geographical location and the competencies of SACCOS board members (Tehulu, 2021; Nyangarika & Bundala, 2020). While these factors had some influence, their contributions to the financial sustainability of MFIs in the context of savings mobilization remained minimal (Masanyiwa et al., 2022). Previous studies suggested lowering administrative expenses to enhance financial sustainability by linking internal institutional factors with financial self-sufficiency in Tanzania. However, it was unclear how administrative expenses could be reduced and what impact such reductions would have on the financial sustainability of MFIs. To address this gap, this study sought to assess the contributions of ABC applications in strengthening SACCOS' savings, which are essential for their financial sustainability. Since its inception in the 1980s, the application of ABC in cost management has continued to gain popularity across various business disciplines, ranging from general manufacturing to service oriented operations (Hansen et al., 2022). More recently, researchers have begun to develop

an interest in assessing the applications of ABC specifically within MFIs, including a study by Putri et al. (2021). The primary role of MFIs is to alleviate poverty by providing affordable loans to their members (Audu et al., 2021). According to Chomen (2021), increased savings enable MFIs to fulfill their core objective of meeting members' credit demands under favorable terms. However, in practice, this expectation has not been met, as MFIs often charge exorbitant interest rates on their loan products, an issue deemed unfair by Wondirad (2022). As a result, members become discouraged from increasing their savings within their respective MFIs, diminishing their chances of accessing low cost credit. Consequently, this leads to liquidity challenges for MFIs.

Despite the fact that both financial and non-financial factors significantly influence the overall performance of microfinance institutions (MFIs), poor financial management carries greater weight in explaining the declining performance of SACCOS (Magashi et al., 2023). A continuous decline in membership and share base, among other performance indicators, has clearly demonstrated the impact of liquidity issues in Tanzanian SACCOS (Magashi et al., 2024).

Towo et al. (2022) reported that the decline in membership and share base was primarily attributed to limited credit availability, which heavily depends on the amount of savings within these institutions. Consequently, savings mobilization has emerged as a key strategy for enhancing the performance and sustainability of SACCOS (Kamau et al., 2024). However, the question that remains unanswered is: What are the most effective savings mobilization strategies that Tanzanian SACCOS can implement in their daily operations? This study specifically examined the effectiveness of activity-based costing (ABC) in reducing borrowing costs as a

strategy for attracting more savings from members, ultimately improving the financial sustainability of MFIs.

Literature Review

Pricing of Loan Products by SACCOS

SACCOS are registered groups of organized members who share a common interest in mobilizing funds to extend credit among themselves (Mbegu et al., 2024; Msuya, 2020). According to the Co-operative Societies Act of 2013, daily operations of SACCOS in Tanzania are managed by boards consisting of no more than nine members, selected from among themselves. To qualify for membership, an individual must purchase a minimum number of shares in accordance with the institution's terms and conditions (Feather & Meme, 2019). More importantly, the amount of an individual member's savings determines their creditworthiness, assuming other factors remain constant. Additionally, some SACCOS accept deposits from both members and non-members, with an agreement to pay interest to depositors after a specified period (Otwoko & Maina, 2021). Generally, the primary operations of SACCOS include selling shares, mobilizing savings and deposits and extending credit to members. According to Tchuigoua et al. (2020), lending is the core function that drives the microfinance institution (MFI) business cycle. Proper pricing of loan products plays a crucial role in ensuring that lending remains the engine of SACCOS operations (Nalyanya et al., 2021).

Pricing loan products involves determining and setting interest rates based on the operational costs of a financial institution (Ashraf et al., 2021). For SACCOS in particular, the computation of interest rates considers operational expenses as a key factor that varies directly in proportion to the interest rate (Adams & Datt, 2017). A

reduction in operational expenses leads to lower interest rates on loans. On the other hand, Et al. (2020) raised concerns about loan losses, primarily caused by defaults. The study suggests that when provisions for loan default losses are high, interest rates on loans are also set higher to compensate for such losses. Other factors affecting interest rates, as reported by Ahnert et al. (2023) and Dorfleitner et al. (2020), include the cost of funds and capital growth within institutions. A higher cost of funds and capital growth generally result in higher interest rates, which are essential for covering financial expenses and supporting business expansion. Non-interest income is the only factor that suggests lower interest rates when its value increases (Boungou & Mawusi, 2022). The study findings indicate that as non-interest income rises, the interest charged on loans decreases, and vice versa. CRDB Bank PLC (2023) consolidated all these factors into the following formula:

If;	r	–	<i>Interest Rate</i>
OE	–	<i>Operational Expenses</i>	
LL	–	<i>Loan Losses</i>	
CF	–	<i>Cost of Funds</i>	
CG	–	<i>Capital Growth</i>	
NI	–	<i>Non-interest Income</i>	
NPL	–	<i>Non-performing Loan</i>	
LP	–	<i>Loan Portfolio</i>	

Then, r per annum is computed as;

$$r = \left(\frac{OE + LL + CF + CG}{1 - NPL} - NI \right) * \frac{100}{LP}$$

Source: CRDB Bank PLC (2023)

Loan Interest Rate and Savings Mobilization

Interest rates on loans play a significant role in the overall performance of savings and credit cooperative societies (SACCOS) (Otwoko, 2023). However, Mogesi (2024) revealed that the impact of interest rates on SACCOS performance is not direct, unlike

other factors such as capital adequacy, firm size, and credit availability. Bashir et al. (2022) previously observed that the ability of microfinance institutions (MFIs) to utilize their capital to withstand shocks from unexpected non-performing loans has a direct impact on their financial performance. Meanwhile, Gikunju (2023) linked savings levels to firm size, which is defined by the number of active members in a SACCOS. The study asserted that as members increase, savings levels also rise due to higher deposits from members. However, this relationship applies only to SACCOS with active members; in contrast, for SACCOS with dormant members, firm size has no significant impact on savings levels (Duguma et al., 2024). Although the amount of savings determines the extent of available credit, credit availability also influences the amount of savings in a cyclic manner (Karoki & Mungai, 2022). None of these studies reported a direct impact of interest rates on savings levels, with several studies including Mogesi (2024) indicating a negative relationship between the two variables. To address this research gap, this study specifically examined the impact of interest rates on savings growth through the creation of affordable loan products for members. Ultimately, savings levels determine the institutional financial leverage through the ratio of internal financing (savings) to external debt secured from outside sources.

Activity-based Costing (ABC) Applications

ABC is a branch of management accounting that serves the purpose of providing both financial and non-financial information for management decision-making (Weygandt et al., 2021). According to Bhimani (2001), ABC was specifically introduced to replace traditional costing, which had become inefficient in cost management due to technological

advancements and the overwhelming increase in overheads within company cost structures. Initially, ABC was designed for manufacturing companies, but its applications gradually expanded to other business fields (Latorre et al., 2022). Regardless of the industry, ABC implementation follows five general steps in cost assignment (Hansen et al., 2022). The first step is to identify all activities involved in producing the cost object (Weygandt et al., 2021). Unlike traditional costing, which allocates resources to departments, ABC groups similar activities together in the second step before assigning resources to cost pools in the third step (Hansen et al., 2022). The final two steps involve identifying and applying cost drivers to allocate overhead costs to the cost object (Asokan, 2023). The total cost is then obtained by adding total direct costs to total overhead expenses.

This study employed the ABC system as a costing technique to compute the average interest rate for loan products issued by SACCOS in Tanzania, with its impact later assessed in relation to attracting savings. According to Baykasoglu and Kaplanoglu (2008), the five steps of ABC application in the service industry are condensed into two phases: resource allocation to activity cost pools and overheads allocation to cost objects using appropriate drivers.

For SACCOS operations specifically, the drivers applied in both phases of allocation were largely similar, primarily based on time spent and the number of product beneficiaries (Pimhidzai et al., 2019; Mashayekhi & Ara, 2017). Since the study focused on determining the appropriate interest rate for loan products among other cost objects, it sought to answer the following question:

Research Question: What is the minimum loan interest rate that will still make Tanzanian SACCOS financially sustainable?

More importantly, the study extended its analysis to assess the impact of the proposed interest rate on attracting additional savings to the associations. This represents the study's main contribution, as it deviates from the conventional assessment of the causal effect of savings on credit, which has been the focus of previous studies, including Mia et al. (2021). In an effort to address the literature gap regarding the causal effect of credit pricing on savings growth, this study tested the following alternative hypothesis:

Hypothesis: The causal-effect of loan interest rate on the increase of savings in Tanzanian SACCOS is statistically significant.

Theoretical Literature Review

Trade-off Theory of Capital Structure

Kazungu and Ndiege (2020) reported that most SACCOS in Tanzania heavily relied on external debt to finance their operations, resulting in significant financial leverage within their capital structures. The burden of servicing these debts has become overwhelming, often jeopardizing their financial sustainability (Mwanzia & Makori, 2023). Contrary to the trade-off theory, which advocates balancing internal and external financing, this study promotes zero-leverage financing for SACCOS, as recommended by Haddad and Lotfalici (2019). The key to achieving zero leverage is incentivizing members to strengthen the internal financial base of their institutional capital structures. Lowering loan interest rates was identified as a strategic incentive for mobilizing savings from members, aligning with the study's objective. To modify the trade-off theory, this study employed the ABC system in SACCOS pricing as a mechanism for reducing loan interest rates. This approach is further supported by institutional theory, which emphasizes the role of regulations, rules, and procedures in shaping microfinance institutions

Institutional Theory

The concept of institutions was first introduced by William Scott in the 1990s and later developed into a comprehensive theory by Paul DiMaggio and Walter Powell in the 2000s to explain the three external forces that shape organizations. These forces include mimetic, normative and coercive pressures, which can influence an organization's success or failure (Saikia et al., 2024). Microfinance institutions operate under coercive pressure, meaning they are required to function within the framework of established laws and regulations (Chiu, 2017). In Tanzania, the operations of SACCOS are governed by the Cooperative Society Act of 2013, supplemented by specific regulations introduced in 2016 (Nade, 2020). According to this law, a member may borrow an amount not exceeding three times their total savings (Msuya et al., 2023; Nade, 2020). Consequently, members are encouraged to increase their savings in order to qualify for larger loans. This study examined the impact of low interest rates used as an incentive to borrow on attracting members' savings to SACCOS.

Conceptual Framework

The leveraging of the SACCOS capital structure is summarized in Figure 1 below, which consists of three sections. The first section, representing the independent variable, is defined by the application of ABC in SACCOS operations to compute the pricing of loan products, as well as other financial products such as shares and deposits. The middle section, defined by the loan interest rate, serves as the mediator between ABC applications and the increase in savings. Finally, the third section, positioned on the right, represents the outcome variable the increase in savings resulting from changes in loan pricing.

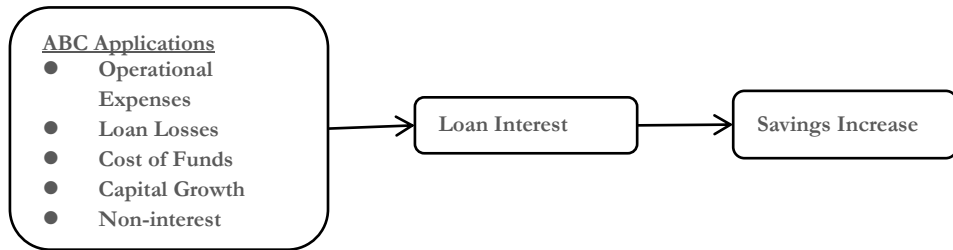


Figure 1: Conceptual Framework of the Study

Source: Authors' Own Summarization of the Conceptual Relationships

Methodologies

Research Design, Approach and Sampling Technique

The study employed the simultaneous equation model (SEM) to analyze both primary and secondary data, which were obtained through a cross-sectional survey design and desk review respectively. The model involved a two-stage regression process: first, estimating the average loan interest rate and subsequently assessing its impact on savings growth using a binary logistic regression model. For consistency, the same units of analysis were referenced in both stages. The formula by Krejcie and Morgan (1970) was used to determine the sample size due to its suitability for large populations. The research areas included Dar es Salaam, Arusha, and Dodoma regions, selected based on their relatively high number of registered SACCOS compared to other regions (refer to the Statistical Cooperative Report, 2023).

Considering the population proportion ($p = 0.5$) of maximum value, model fitness estimated by chi square ($\chi^2 = 3.8416$), degree of precision (d) expressed as a proportion (0.05) and population size (N).

$$n = \frac{\chi^2 * N * p(1 - p)}{d^2 * (N - 1) + \chi^2 * p(1 - p)}$$

$$n = \frac{3.841 * 716 (2,033,599^m) * 0.5(1 - 0.5)}{0.05^2 * (716 (2,033,599^m) - 1) + 3.841 * 0.5(1 - 0.5)}$$

$$n = 250.22 (384.03^m)$$

Note: Value with power “ m ” denotes members of SACCOS while “ n ” denotes number of SACCOS.

Therefore, the computed samples of 250 for SACCOS and 384 for members of SACCOS were then subdivided into six (6) strata as per the percentage division in the respective populations.

The ratio of members to SACCOS, based on the computed sample figures, is 1.536, which has been rounded to 2. Accordingly, in the first phase of data collection, secondary data were obtained from the records of 192 SACCOS (76.8% of the units of inquiry), selected using simple random sampling without replacement. Sataloff and Vontela (2021) regarded 76.8% as outstanding coverage for generalization purposes, as it exceeded the 75% threshold. In the second phase, primary data were collected from at least two units of inquiry, consisting of members of the sampled SACCOS. The selection process was also conducted using simple random sampling

without replacement, resulting in a total of 384 interviewed members.

Conceptualization of Variables

Variables in this study were measured using different techniques as recommended from

previous studies. Table 2 below gives the summary of the scales of measurements used as borrowed from previous studies:

Table 1: Sample Size Division Among the Three (3) Strata ($n_1 = 250$ and $n_2 = 384$)

SACCOS	DAR ES SALAAM	ARUSHA	DODOMA	TOTAL
Population (N_1)	517	142	57	716
Sample (n_1)	180	50	20	250
Adjusted Sample MEMBERS	138	38	16	192
Population (N_2)	1,596,222	318,391	118,986	2,033,599
Sample (n_2)	276	76	32	384

Source: United Republic of Tanzania (2023)

Table 2: Measurement of Variables

Variable/ Indicator	Definition	Measurement	Source
Operational Expenses	Costs incurred in undertaking the day to day operations of the MFI	Continuous variable measured by the amount of money spent on short-term core activities of MFIs	Uddin et al. (2024)
Cost of Funds	Cost incurred by the MFI to secure funds for lending out to members	Continuous variable measured by the amount of money paid to obtain loan, grants, savings or donations for lending purpose	Dirse & Japee (2024)
Capital Growth	An increase in value of asset resulting from either an increase in investment or retained earnings	Ratio variable measured by an upward increase in shares of the MFIs	Wirasedana et al. (2024)
Non-interest Income	Income earned by the MFI out of interest charged on loans	Continuous variable measured by amount of money obtained by MFI as the profit other than interest received from loans	Dzingirai & Dzingirai (2024)
Loan Interest Rate	Amount of profit from loan expressed in percentage that is expected to be received from borrowers	Continuous variable measured by the amount of money expressed in percentage to be received as the profit from loans extended to members of MFI	Sanchez et al. (2024)
Savings Increase	An increase in amount of savings from members of MFI	Continuous variable measured by an increase in amount of fund committed by members for borrowing purpose	Hasan et al. (2025)

Source: Compilation of Various Studies as in the Table 2 Above

Research Findings

Phase I SEM

The first phase of data analysis, based on the simultaneous equation model (SEM), involved computing the loan interest rate from secondary data. Before the

computation stage, a normality test was conducted, with both the Kolmogorov-Smirnov and Shapiro-Wilk tests confirming that the data followed a normal probability distribution pattern, as summarized in Table 3 below.

Table 3: Tests for Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Residuals	.128	186	.200*	.967	186	.567

Source: Normality Test Results

Table 4a: Summary of ABC Applications in SACCOS Operations

Activities Identification	Resources Allocation (TZS.)	Activity Cost Pools (TZS.)	Cost Driver	Elements of Cost Object
Buying stationery	3,961,500	<i>Operational Expenses</i>	<i>Unit Cost</i>	<i>Operational Expenses</i>
Hospitality	1,948,500			
Transport	4,849,300			
Communication	5,710,000			
Conducting annual meetings	41,835,000			
Board, credit, supervisory and other meeting	12,610,500			
Postal charges	132,750			
Participating in social activities	17,700,000			
Development of members	24,317,400			
Development of board and supervisory committee	11,525,000			
Development of staff	10,253,800			
Administration	1,750,000			
Salaries	31,800,000			
Overtime	2,390,000			
Pension scheme contributions	3,180,000			
Workers' compensation fund contributions	189,540			
Health insurance	1,110,000			
Staff Uniform	1,750,000			
Utilities	1,320,000			
TOTAL	178,333,290	178,333,290	66.52%	118,632,757
Loan recovery	4,140,000	<i>Loan Losses</i>		<i>Loan Losses</i>
Non-performing asset	12,863,100			

Source: Authors' Summary of Computations from the Secondary Data

Table 4b: Summary of ABC Applications in SACCOS Operations

TOTAL	17,003,100	17,003,100	66.52%	11,310,982
Registrar's approval of budget	3,463,803	<i>Cost of Funds</i>		<i>Cost of Funds</i>
Interest on savings	53,695,123			
Interest on deposits	13,364,222			
Bank charges	2,122,493			
Advertisement	7,777,000			
Auditing	2,500,000			
TOTAL	82,922,641	82,922,641	66.52%	55,162,676
Recruitment of staff and new members	2,522,000	<i>Capital Growth</i>		<i>Capital Growth</i>
Office maintenance	4,842,000			
Purchase and maintenance of Accounting package	3,980,000			
TOTAL	11,344,000	11,344,000	66.52%	7,546,376
Fee on application form	2,400,000	<i>Non-interest Income</i>		<i>Non-interest Income</i>
Loan application fee	37,500,930			
Membership admission fee	2,800,000			
Penalties	4,081,567			
Investments	551,004			
TOTAL	47,333,501	47,333,501	66.52%	31,487,692
Loan portfolio		3,750,093,000		
Shares		437,158,981		
Savings		1,250,031,000		
Deposits		200,000,000		
Non-performing loan (Allowable Percentage by BOT, 2023)		5%		

Source: Authors' Summary of Computations from the Secondary Data

Following the ABC application procedures, data collected from 192 SACCOS were averaged into activity cost pools before being allocated to the interest rate as the cost object, using the unit cost attributed to output. Given the nature of the activities and the cost object, the entire cost structures consisted solely of overhead

costs. Table 4 below summarizes the ABC application procedures used in assigning costs to the interest rate.

Hence, from table 4 above, the average loan interest rate was obtained using the formula below;

$$r = \frac{(118,632,757 + 11,310,982 + 55,162,676 + 7,546,376 - 31,487,692) * \frac{100}{3,750,093,000}}{1 - 0.05}$$

$r = 4.57\%$ per annum

The answer to the research question is that the application of Activity-Based Costing (ABC) led to the estimation of an average loan interest rate of 4.57%, which served as the threshold for SACCOS' self-sufficiency.

Phase II SEM

The second phase of the simultaneous equation model (SEM) involved assessing the causal relationship between the results obtained in Phase I and the outcome variable (savings increase). Given the nature of the dependent variable, which had only two possible outcomes, a binary logistic regression model was specifically employed for analysis. The outcome of savings increase was assigned a value of 1, while the alternative outcome, indicating no increase, was assigned a value of 0. The Hosmer-Lemeshow goodness-of-fit test confirmed that the model was well-suited

to the data, as the p-value ($p = .999$) was greater than 0.05.

The purpose of computing the loan interest rate in Phase I was to evaluate whether the recommendation by BOT (2023), which requires financial institutions to maintain single-digit interest rates, is practical in ensuring SACCOS self-sufficiency. As part of this assessment, interviewees were asked whether they would be inclined to save more in their respective institutions to access loans with interest rates below 10%. Had the computed interest rate exceeded 10% after applying the ABC system in SACCOS operations, the second phase of the SEM analysis would have been rendered irrelevant.

The analytical results in Table 5 substantiate that the odds of savings increase were 2.824 times higher for SACCOS that charged a loan interest rate of less than 10%, compared to those that charged 10% or more. Given that the p-value ($p = .028$) is less than 0.05, the hypothesis was not rejected. Therefore, the causal effect of loan interest rates on savings increase in SACCOS was found to be statistically significant.

Table 5: Hosmer-Lemeshow Test

Step	Chi-Square	df	Sig.
1	.890	383	.999

Source: Goodness of Fit Test Results

Table 6: Binary Logistic Regression Analytical Results

	B	S.E	Wald	df	Sig.	Exp(B)
Step1 ^a	1.038	.472	4.843	383	.028	2.824
	-3.964	.412	92.522	383	.000	.019

Source: Logistic Regression Results

Discussion of the Findings

The desk review exercise revealed that the average interest rate on loan products offered by SACCOS was 14.5%, significantly exceeding the BOT-backed single-digit rate. SACCOS, along with other MFIs and commercial banks in Tanzania, were hesitant to adopt single-digit interest rates due to concerns about jeopardizing their financial sustainability. However, what they may not have realized is that transitioning to a single-digit rate is a crucial step in shifting the equilibrium of the capital structure toward zero leverage, which is more beneficial for SACCOS compared to other capital structure configurations, as noted by Haddad and Lotfaliei (2019). The findings of this study support BOT's (2025) recommendation for adopting single-digit interest rates in two key scenarios. First, SACCOS can still achieve operational self-sufficiency at an interest rate as low as 4.57% per annum. At this level, MFIs can cover their day-to-day operational costs without financial strain or reliance on external funding sources. Second, lowering interest rates to single digits is critical for attracting more member savings, which helps increase institutional capital while reducing dependence on external debt. The study's findings revealed that members were more inclined to commit additional savings to their respective associations to qualify for affordable credit. SACCOS in Tanzania have a viable path to financial self-sufficiency by reducing loan interest rates to as low as 4.57% per annum.

Conclusion and Recommendations

It is concluded that the application of ABC is essential for understanding the actual cost of loans offered by MFIs, not only in Tanzania but also from a global perspective. Management and board members are encouraged to transition from traditional methods of computing interest rates on loan products to an ABC-backed approach. ABC not only ensures the accuracy of interest rates charged on loans but also provides management with an opportunity to identify and eliminate non-essential activities that do not directly contribute to the core business operations of MFIs. In this regard, future studies are recommended to assess the contributions of ABC applications in identifying redundant activities that should be eliminated to reduce operational costs. This strategy will not only save MFIs time spent on non-productive activities but will also enhance financial self-sufficiency by minimizing operational expenses.

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