Borrower Characteristics and the Level of Non-Performing Loans among Saving and Credit Cooperative Societies in Tanzania: Moderating Effects of the Educational Level of Loan Committee Members

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Abstract

This study investigates how borrower characteristics influence non-performing loans (NPLs) among 45 SACCOs in Ubungo Municipality from 2017 to 2024. Specifically, the study analyzed the influence of borrowers' income level, borrowers' loan purpose, and borrowers' credit history on NPLs, while also examined the moderating effect of loan committee members' educational level, covering financial statements and regulatory supervision reports. Descriptive statistics (mean, standard deviation, skewness, and kurtosis) and inferential statistics (Pearson correlation and regression analysis using pooled OLS) were computed using SPSS Version 23, supported by robustness checks. A two-way fixed-effects panel model shows that higher borrower income, productive-purpose loans, and stronger credit histories reduce NPLs, while higher loan-committee education further strengthens these relationships. Policy recommendations include stricter borrower profiling, committee qualification standards, and alignment of repayment schedules with income cycles.

Keywords: *Non-performing loans; borrower characteristics; loan-committee education; SACCO*

INTRODUCTION

Globally, banks, microfinance institutions, and Savings and Credit Cooperative Societies (SACCOs) are affected by the serious problem of non-performing loans (NPLs) (IMF, 2019). Excessive NPL levels jeopardise economic growth, restrict loan availability, and weaken financial stability (Metto, 2020). The International Monetary Fund (IMF) claims that the 2008 global financial crisis caused a sharp rise in NPLs in numerous nations, which prompted authorities to improve credit risk management procedures. However, borrower-level determinants in SACCOs remain under-documented (Mutai, 2018; Musau et al., 2018). Regulatory frameworks such as the Basel Accords (BA) have been implemented in developed economies

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to reduce non-performing loans and manage credit risk (BCBS, 2017). However, because of low governance, subpar credit evaluation, and unstable economies, financial institutions, SACCOs in particular, continue to face significant default rates in many developing nations, especially those in Africa (Towo, 2023).Non-performing loans in Tanzania averaged 7.89% from 2010 to 2018, with a maximum of 11.52% in 2017 while the world's average based in 129 countries during the same period is 6.78%, which is relatively lower than that of Tanzania (BoT, 2018; NBS, 2024). Non-performing loans is, therefore, one of the major causes of financial losses experienced by financial institutions in Tanzania (Mwakabalula & Mwamkonko, 2024).

According to Kroszner (2015), non-performing loans are those loans that are no longer being serviced by a borrower. The SACCOs Act (2008) defines non-performing loans as those loans in the portfolio that are more than 90 days overdue on interest or principal repayments and are disclosed in the supplemental financial statement information.

Many SACCOS in Africa, such as Ghana, Kenya and Tanzania, experienced problems with non-performing loans (Mmari & Thinyane, 2019). For example, a study in Ghana by Yeboah and Oduro (2018) indicates that loan default was a major concern in credit unions. In Tanzania, the Ministry of Agriculture, Food, Security, and Co-operatives report indicates that out of 5424 registered SACCOS, only 1,346 (25%) were active (Ndiege et al., 2016). Furthermore, the Tanzania Cooperative Development Commission (TCDC, 2023) report indicates that the Tanzanian shilling is 1,299. 66 billion were issued as loans, and 490.33 billion (37%) was still outstanding.

In Tanzania, to maintain their financial viability, SACCOs are subject to regulations from the Tanzania Cooperative Development Commission (TCDC, 2019) and the Bank of Tanzania (BoT) (2019) that aim to curb NPLs. Notwithstanding these regulatory initiatives, NPLs continue to pose a serious issue (Kalula & Kiriinya, 2018). According to studies, loan defaults in Tanzanian SACCOs are driven by several factors, including inadequate credit risk management (Magash et al., 2023), weak internal controls (Kadaga, 2020), and unstable economic conditions (Metto, 2020). Many SACCOs in Ubungo Municipality struggle to return their loans because of poor loan evaluation methods, a dearth of collateral, and a lack of follow-up with defaulters (TCDC, 2023). Developing successful methods to enhance the loan performance and financial sustainability of SACCOs requires an understanding of these aspects (Towo, 2023; Magali, 2023). Although BOT and TCDC established regulatory frameworks in 2018, many SACCOs,

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especially those in Ubungo Municipality, continue to face substantial loan delinquencies (TCDC, 2023). Nationally, the ratio of non-performing loans to total gross loans in Tanzania decreased by 1.2 percentage points, from 15.73 per cent in 2022 to 14.53 per cent in 2024 (NBS, 2024). Despite this improvement, the NPL ratio has been higher in recent years than in preceding years, indicating ongoing challenges in loan performance (Ubungo Municipality report, 2024).

Few studies have examined the difficulties faced by SACCOs in Tanzania, especially in Ubungo, because most prior studies on NPLs have focused on commercial banks and other microfinance institutions (see, for example, Kalula & Kiriinya, 2018; Magali, 2023; Metto, 2020). Macroeconomic variables such as inflation and interest rates are the focus of many current studies, but little is known about how certain borrower characteristics affect non-performing loans in SACCOs (Mwenda et al., 2021). Improving the financial sustainability of SACCOs in Tanzania requires understanding the factors driving high levels of non-performing loans (Magash et al., 2023). This study offers insights into practical methods for reducing the level of non-performing loans and bolstering SACCO operations by analysing how borrower characteristics, using the Asymmetric Information Theory (AIT), influence NPLs (Mwakabula & Mwamkoko, 2024). By addressing these gaps, this study offers practical recommendations to improve SACCOs' credit risk management, strengthen internal policies, and ensure long-term financial stability (Msuya, 2023). The findings contribute not only to academic knowledge but also to policy formulation and financial sector improvements, benefiting SACCOs, regulators, and cooperative members in Tanzania.

Despite the various studies regarding economic and regulatory variables affecting NPLs, studies focusing on the joint impact of loan terms, and borrower behavior in Tanzanian SACCOs remain relatively scanty(However, borrower-level determinants in SACCOs remain under-documented (Mutai, 2018; Musau et al., 2018; Munene et al., 2017; Mjatta et al., 2016).Non-Performing Loans In Nigeria's Microfinance Banks behavior of borrowers are thus the two foremost elicits of repayment outcomes related to over-leveraging and loan diversion (Msuya, 2023). Understanding the link between loan conditions and borrowers' behavior, and their consequences for NPLs in Tanzania's microfinance sector, remains underexplored (Mapunda, 2019).

Problem Statement and Significance of the Study

Savings and Credit Cooperative Societies (SACCOS) are pivotal to financial inclusion and local economic development in Tanzania (Magali, 2023).

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Nevertheless, despite their importance, persistently high non-performing loans (NPLs) pose a threat to their sustainability (Magash et al., 2023). A substantial body of African evidence attributes NPLs to financial, regulatory, and macroeconomic conditions (Kadaga, 2020; Magash et al., 2023; Metto, 2020). However, far fewer studies for example Mmari & Thinyane (2019); Mwakabula and Mwamkoko (2024); Ndiege et al. (2016) interrogate how borrower behavior and loan conditions jointly drive default, particularly within Tanzanian SACCOS. Much of the extant work concentrates on commercial banks and other microfinance institutions, overlooking municipal-level SACCOS such as those operating in Ubungo (Mapunda, 2019). Notably, even with the Bank of Tanzania and the Tanzania Cooperative Development Commission issuing strengthened regulatory frameworks in 2018, SACCOs in Ubungo have continued to report elevated delinquency (TCDC, 2023). This disconnects between regulatory effort and portfolio outcomes underscores an unresolved, practice-critical gap.

Beyond macro- and regulatory-level factors, repayment performance hinges on borrower-related dynamics and the structure of the loans they receive (Mutai, 2018; Musau et al., 2018; Munene et al., 2017). Evidence from microfinance settings, including Nigeria's microfinance banks, highlights borrower behavior (notably over-leveraging and loan diversion) as a foremost elicitor of default, interacting with loan terms to exacerbate repayment risk. (Not cited) In Tanzania's microfinance sector, the specific pathways linking loan conditions to borrower behavior and their consequences for NPLs remain underexplored (Mapunda, 2019). This gap is especially salient for SACCOS, where lending is often relationship-based, and information asymmetries can be acute.

Guided by Asymmetric Information Theory (AIT), this study focuses on borrower characteristics, particularly unstable income levels, loan diversion, and poor credit history as proximate drivers of repayment outcomes (Mori, 2016). It further recognizes that the quality of organizational decisions matters: loan committees with limited financial knowledge may inadvertently approve riskier loans, thereby worsening default rates (Nyabwari & Kimutai, 2024; Musau et al., 2018). However, the literature has not sufficiently examined how borrower characteristics interact with loan committee competence (proxied here by education) to shape NPL outcomes in SACCOS. Addressing this omission, the present study investigates borrower characteristics and the moderating role of loan committee education in SACCOS operating within Ubungo Municipality.

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The significance of this inquiry is threefold. First, it advances practice by identifying borrower behaviors and loan-term features that are most associated with delinquency. By considering committee education as a moderating governance factor, the study provides actionable guidance for improving screening, underwriting, loan-use monitoring, restructuring, and member education. Second, it informs policy and regulation, as the findings can help the Bank of Tanzania, the Tanzania Cooperative Development Commission (TCDC), and municipal authorities refine supervisory guidelines, establish competency standards for loan committees, and design targeted capacity building programs for SACCOs (Magash et al., 2023).Third, it contributes to scholarship: by centering on municipal SACCOS and analyzing the borrower-loan-terms governance nexus, the work fills a documented gap in the literature, which has concentrated on banks, macro factors, or national aggregates (Magali, 2023; Metto, 2020). In doing so, it provides context-specific evidence directly relevant to SACCO resilience, member welfare, and inclusive finance in Tanzania.

The period from 2017 to 2024 was deliberately chosen to ensure analytical depth and policy relevance. The year 2017 represents the pre-reform baseline, preceding the regulatory strengthening initiated by the Bank of Tanzania (BoT) and the Tanzania Cooperative Development Commission (TCDC).In 2018, both institutions introduced enhanced oversight measures under the amended Cooperative Societies Act and new BoT microfinance supervision guidelines, emphasizing prudential standards, accountability in governance, and improved loan portfolio classification. These reforms aimed to professionalize SACCO management and standardize credit-risk practices across the sector. The period 2019–2021 marks the adjustment phase, as SACCOs internalized these reforms amid macroeconomic pressures, including inflation and the COVID-19 pandemic, which tested borrower repayment capacity and institutional resilience. In 2022–2023, further TCDC circulars reinforced compliance and reporting standards, yet official reports continued to record elevated non-performing loans (NPLs), especially in urban SACCOs (TCDC, 2023). Extending the window through 2024 captures the most recent audited data and allows assessment of whether persistent NPLs reflect structural weaknesses or transitional challenges under matured regulation.

Collectively, this 2017–2024 time-frame offers a coherent and empirically rich foundation to examine how borrower characteristics, loan terms, and loan-committee education interact under evolving regulatory and economic conditions in Tanzania's SACCO sector yielding findings of direct relevance to practitioners and policymakers.

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LITERATURE REVIEW
Theoretical Literature Review

The theoretical foundation of this study is grounded in financial inter-mediation theories that explain the behaviour of borrowers and lenders under conditions of uncertainty and risk. The key theories relevant to this study are Asymmetric Information Theory (AIT) and Moral Hazard Theory (MHT).

Asymmetric Information Theory

Asymmetric Information Theory (AIT), initiated by Akerlof (1970) and developed notably by Stiglitz (1981) and others, provides a foundational lens through which to understand the challenges in credit markets arising from unequal access to information (Akerlof, 1970; Stiglitz & Weiss, 1981). In lending relationships, borrowers typically possess more accurate and complete knowledge of their financial status and repayment ability than lenders ((Nyayiera & Muchiri, 2023; Nyabwari & Kimutai, 2024). This information-gap creates uncertainty for lenders, complicating the distinction between high-risk and low-risk borrowers (Kipyego, 2013; Stiglitz & Weiss 1981). Consequently, the likelihood of loan defaults may increase, contributing to a rise in non-performing loans (NPLs) (Msuya, 2011).

To address this issue, financial institutions often implement screening mechanisms (for example, credit history evaluation and cash-flow assessment) (Okundi, 2015; Provenzano & Arnone, 2015). The theory emphasises that, beyond borrower disclosure, the capacity of lenders (or their committees) to appraise, monitor, and control loans through education or training in loan-process governance is also crucial. Therefore, AIT is particularly relevant to this study: it highlights the need for robust credit assessment and monitoring mechanisms (through borrower transparency and committee competence) to close information gaps and thus minimise NPLs (Zhang, 2023). Moreover, this theory is important for the present study because SACCOs typically lend in environments of opaque borrower information. By specifying income, loan purpose and credit history as observable signals, AIT provides the logic for expecting these borrower characteristics to lower NPLs once they are appropriately screened. It also justifies introducing loan-committee education as a moderator, since better-educated committees are more capable of reducing information gaps.

The Moral Hazard Theory

The concept of moral hazard was formalized by Holmström (1979) in the context of contractual relationships, and further extended to credit markets by Stiglitz and Weiss (1981). Moral hazard arises when one party to a transaction engages in opportunistic behaviour, such as misrepresenting

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financial conditions or undertaking excessive risk, because the potential negative consequences are borne partly or fully by another party (Kargi, 2011). In lending arrangements, this often involves borrowers concealing critical information about their assets, liabilities, or repayment capacity, or diverting loan funds for unintended purposes (Georgiadis, 2022). Such behaviour leads to inefficiencies in financial contracts and increases the likelihood of default (Singh, 1984). Within SACCOs, moral hazard is evident when borrowers provide misleading information or when loan officers fail to enforce proper monitoring and follow-up, resulting in higher levels of non-performing loans (Provenzano & Arnone, 2015). This challenge has been highlighted during periods of financial instability, where weak governance structures exacerbate loan delinquency risks (Kargi, 2011). The theory is therefore relevant to this study, as the sustainability of deposit-taking SACCOs depends on reducing information asymmetries and ensuring that borrowed funds are used productively, thereby minimizing defaults and supporting broader economic growth (Kargi, 2011).

Moral Hazard Theory contributes to the study by explaining default that occurs after loan approval, especially where borrowers divert funds or under-report repayment capacity. In SACCOs, this risk is higher because monitoring resources are limited. Showing that educated loan committees reduce this problem closes a theoretical gap on how governance quality can curb borrower opportunism. This theory is relevant to the study because it helps explain how borrower behaviour and weak monitoring contribute to loan defaults in SACCOs. It highlights the need for effective screening, monitoring, and enforcement mechanisms to minimize lending risks. The main strength of the theory is that it offers a clear understanding of the behavioural side of credit risk and the importance of monitoring in reducing defaults. However, its weakness lies in assuming that all borrowers act opportunistically and in overlooking the institutional and cooperative context of SACCOs.

The study addresses this gap by introducing the education level of loan committee members as a moderating factor. Educated committees are more capable of assessing borrower information, enforcing loan conditions, and reducing moral hazard, thereby improving loan performance and SACCO sustainability.

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Empirical Review and Hypothesis Development

Influence of Borrower Characteristics on the Level of Non-Performing Loans

Several borrower characteristics influence the loan repayment behaviour, which, in turn, affects the level of NPLs.

The Influence of Borrowers' Income Level on the Level of NPLs.

Across SACCO and microfinance contexts, higher and more stable borrower incomes are consistently associated with better repayment and lower delinquency rates (Musau et al., 2018). Recent Tanzanian evidence shows that stronger information practices and member profiling improve loan portfolio quality mechanisms that are tightly linked to verifying income capacity and repayment ability (Mwaipaja et al., 2024). Studies such as Ndwiga and Ouma (2020) have shown that borrowers' income levels significantly reduce loan delinquency in SACCOs. Musau et al. (2018) also highlighted that borrowers' income levels affect loan repayment and reduce NPLs in cooperative societies. Members with higher incomes tend to have more disposable income and are more likely to make timely loan repayments (Provenzano & Arnone, 2015). Higher income also correlates with greater ability to repay loans, thereby reducing the likelihood of defaults (Mbowe, 2023). Moreover, the study of Ntoiti and Jagongo (2021) found that borrowers with higher incomes are less likely to default on loans. The study suggests that higher-income individuals typically have greater financial flexibility, enabling them to meet their financial obligations, including loan repayments (Muturi et al., 2017). Ndwiga and Ouma (2020) argued that in Kenya, SACCO members with stable incomes exhibited better repayment behaviour. Their research suggests that income level plays a crucial role in reducing the risk of loan defaults.

The Influence of Borrowers' Loan Purpose on the Level of NPLs.

Loan purpose refers to the intended use of borrowed funds by the borrower, typically classified into productive/enterprise-use (e.g., working capital, investment in machinery or inventory, farm inputs) versus consumption/smoothing-use (e.g., school fees, health costs, durable goods, household consumption) (Ngugi, 2019). The underlying premise is that productive-use loans generate income streams or cash-flows that enhance the borrower's capacity to repay, thereby reducing the risk of non-performance (Mbowe, 2023). By contrast, consumption loans rely more heavily on the borrower's exogenous income or savings buffer, and may lack a direct, self-reinforcing income generation mechanism (Musau et al., 2018). In the context of credit portfolio management, this suggests that borrowers with business or investment loan purposes will, ceteris paribus, exhibit lower NPL

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incidence compared to those with consumption-oriented loans (Magali, 2014). Productive loan use (business/investment) generally predicts stronger repayment than consumption-oriented borrowing (Ndambiri et al., 2017). Recent work on digital lending finds that business-purpose loans are associated with better subsequent financial well-being and repayment dynamics than personal/consumption loans, echoing earlier SACCO findings from East Africa (and aligning with your Kenya/Malawi citations) (Chege, 2021).

Emerging evidence on credit terms and repayment preferences also shows borrowers favour schedules aligned to income cycles, which improves performance, particularly for enterprise-purpose loans (Mwaipaja, 2024). A growing body of recent empirical work supports this relationship. For example, in an extensive quasi-experimental study of digital lending Mmari & Thinyane (2019) found that borrowers who were randomly approved for digital credit observed higher income (20.8 % increase) and greater employment likelihood (23.5 %), and that these beneficial impacts were more pronounced for those who used the loan for business purposes. They conclude that access to digital credit improved financial well-being especially when the purpose was business investment. For institutions such as SACCOs in Tanzania, the empirical and conceptual literature (Kadaga, 2020) and Magali (2023) suggest the that when incorporating loan purpose as a variable in NPL prediction models, classifications of loans are based on whether the funds are for business (investment) or consumption smoothing (Chege,2021).

The Influence of Borrowers' Credit History on the Level of NPLs
Credit history refers to a borrower's documented record of past credit behaviour, including repayment timeliness, frequency of defaults, and duration of credit exposure (Muturi et al., 2017). Borrowers with positive credit histories generally present lower credit risk, as their prior repayment behaviour signals higher ability and willingness to repay. Conversely, borrowers with weak or missing credit histories pose higher informational and default risk due to adverse selection. In SACCOs and other lending institutions, incorporating credit-history information during loan assessment enhances underwriting accuracy, minimizes information asymmetry, and reduces non-performing loans (NPLs).

Empirical evidence consistently supports the importance of credit history and information sharing in reducing NPLs and improving loan portfolio quality (Kiptoo, 2020; Kipkemoi, 2017; Mutai, 2018; Nyambwari & Kimutai, 2024; Munene et al., 2017; Mwakabalula & Mwamkonko, 2024; Dong, 2023). In Kenya, Kiptoo (2020) and Kipkemoi (2017) observed that access to detailed

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borrower credit histories enables financial institutions to assess repayment capacity more accurately and reduce delinquency. Mutai (2018) further found that credit information sharing promotes responsible borrowing and discourages serial defaults. Similarly, Nyambwari and Kimutai (2024) emphasized that credit reference bureaus (CRBs) enhance transparency and improve loan appraisal accuracy, thereby improving overall credit quality.

Munene et al. (2017), in their study *"Role of Credit Reference Bureau in Influencing Customer Repayment Behaviour in Mitigating against Credit Default among Commercial Banks in Kenya,"* reported that CRB usage significantly lowers default rates, as borrowers improve repayment discipline when aware their credit histories are monitored. In Tanzania, Mwakabalula and Mwamkonko (2024) found a significant negative relationship between CRB usage and NPLs, confirming that effective credit information sharing reduces loan defaults. Similarly, a regional study in Mwanza (2022) revealed that the credit information bureau variable strongly and positively influences credit performance. Globally, a systematic review (2015–2024) identified credit history as one of the most reliable predictors of loan default. Dong (2023) also demonstrated that alternative data sources, such as mobile transactions, enhance credit scoring accuracy and reduce default risk for small borrowers. Collectively, these studies affirm that robust information sharing through CRBs and alternative data significantly improves credit discipline and portfolio quality.

This means that credit history remains one of the strongest predictors of default. Tanzania's supervisory reports highlight the role of credit reference bureaux and the central credit databank in improving underwriting and reducing NPLs by enabling lenders to verify prior repayment performance (Dong, 2023). Complementary research on alternative data for MSMEs shows that expanding the informational footprint (payments, platform data) can further sharpen risk assessment where formal histories are thin, again lowering default risk (Wilberforce, 2021). Regarding loan purpose and repayment attitude, Muriithi and Waweru (2017) conducted a study in Kenya to assess the role of borrowers' loan purpose. They found that borrowers who borrow for business or investment purposes are more likely to repay loans, as these loans directly contribute to their income generation. Similarly, other studies Mutai, 2018; Chege, 2021; Magash et al., 2023) have shown that borrowers with positive repayment attitudes are more likely to repay their loans on time, thus reducing NPLs. Because of the mixed results in literature, the following hypotheses were developed:

H_1: *Borrower's income level negatively influences the level of Non-Performing Loans.*

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H_2:   *Borrower's loan purpose negatively influences the level of non-performing loans*

H_3:   *Borrower's better credit history negatively influences the level of non-performing loans.*

The Moderating Effect of Loan Committee Members' Educational Level

Loan-committee competence, reflected through education and financial literacy, enhances screening, monitoring, and loan recovery, thereby moderating the relationship between borrower characteristics and non-performing loans (NPLs). Evidence from East Africa indicates that stronger board and committee capabilities improve loan outcomes. Recent Ugandan SACCO studies have linked board-level risk management to better financial performance through superior credit oversight. Similarly, improvements in financial literacy among SACCO stakeholders are associated with enhanced repayment and portfolio quality, reinforcing the moderation channel proposed under Asymmetric Information Theory (AIT). An educated loan committee also engages more effectively with management and promotes accountability. Empirical findings from Nyairera and Muchiri (2023) and Omondi (2017) confirm that higher levels of education among management and board members strengthen credit oversight and repayment performance. In Uganda, management and board education improved internal controls, while Chikalipah (2018) observed that educated leaders promote ethical lending, reducing NPLs. Likewise, Masau et al. (2018) found that financial knowledge improves repayment and reduces defaults in cooperative societies.

Despite these findings, several critical gaps remain. Most prior studies—such as Omondi (2017), Chikalipah (2018), and Masau et al. (2018)—focused on management or board education within banks and cooperatives, but not specifically on *loan committee members* in SACCOs. This is a crucial omission since loan committees directly handle borrower screening, appraisal, and follow-up, making their education more influential in mitigating NPLs. Moreover, existing research mainly used cross-sectional or descriptive designs, limiting insights into long-term effects. This creates a methodological gap for longitudinal or panel-based studies that can reveal how loan committee education interacts with borrower characteristics over time.

Additionally, limited evidence exists in the Tanzanian SACCO context on how the educational level of loan committees moderates the influence of borrower income, credit history, and loan purpose on NPLs. This presents both a contextual and theoretical gap, as the role of educational competence in SACCO governance is underexplored. To bridge these gaps, this study

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applies AIT to examine how education-driven competence among loan committee members reduces information asymmetry and improves credit portfolio quality among SACCOs in Ubungo Municipality.

Hypothesis (H4): The educational level of loan committee members negatively moderates the relationships between borrower characteristics and the level of non-performing loans.

METHODOLOGY

This study was guided by a positivist research philosophy, which assumes that reality is objective and can be measured empirically using observable and quantifiable data (Saunders, Lewis & Thornhill, 2019). Under the positivist stance, the researcher remains independent of the study variables, ensuring objectivity and replicability. This philosophy was considered appropriate because the study sought to establish causal relationships among borrower characteristics, loan-term features, loan-committee education, and the level of non-performing loans (NPLs) in SACCOs—relationships that could be tested using statistical models. An explanatory research design was adopted to identify and quantify cause-and-effect relationships among the study variables. Explanatory design is suitable when the objective is to understand how independent variables influence a dependent variable (Kothari, 2014). In this context, the design facilitated the examination of how borrower income, loan purpose, and credit history affect NPL levels, and how loan-committee education moderates these relationships.

The study employed a quantitative research method, which enables the collection and analysis of numerical data using statistical and econometric tools. Quantitative analysis ensures objectivity and enables the generalization of findings across the sampled SACCOs. A deductive research approach was used, moving from established theoretical propositions particularly the Asymmetric Information Theory (Akerlof, 1970; Stiglitz & Weiss, 1981) toward empirical testing through hypothesis formulation and statistical validation. This sequence aligns with the positivist paradigm, emphasizing hypothesis testing rather than theory generation.

This study used a balanced panel data set, focusing on SACCOs operating within Ubungo Municipality in Dar es Salaam, Tanzania. According to the Tanzania Cooperative Development Commission TCDC), there are 56 SACCOs in Ubungo Municipality, out of which only 45 were audited by Co-operative Audit and Supervision Corporation (COASCO) (TCDC, 2023). We employed criterion-based purposive sampling to restrict the sampling frame to SACCOs with audited financial statements for 2017–2024, ensuring

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comparability and data quality for NPL measurement. Of the 56 registered SACCOs in Ubungo Municipality, 45 met the inclusion criterion and were retained for analysis; 11 were excluded due to missing or audited accounts. Given the modest size of this eligible frame, we implemented total population (census) sampling of the 45 SACCOs. This approach is standard when the key variables rely on audit.

Secondary data were primarily sourced from SACCOs' audited financial statements and cooperative officers' inspection reports. The data collected spans from 2017 to 2024, covering 8 years. SACCOs with missing data were eliminated from the analysis. As a result, only 45 SACCOs with 360 observations were left after elimination.

Econometric Model

The relationships among the study variables were analyses using a multiple linear regression model. The Ordinary Least Squares model was used as the baseline model, as shown hereunder:

$$NPL_{it} = \alpha + \beta_1 BIL_{it} + \beta_2 BLP_{it} + \beta_3 BCH_{it} + \beta_4 (Edu_{it} \times BIL_{it}) + \beta_5 (Edu_{it} \times BLP_{it}) + \beta_6 (Edu_{it} \times BCH_{it}) + a_i + \delta_t + \varepsilon_{it}.$$

Where:

Y_i = Level of Non-Performing Loans, BIL = Borrower's Income Level, BLP = Borrower's Loan Purpose, BCH = Borrower's Credit History, Edu = Loan Committee Educational Level. Also, t is the years which take the value from 2017 to 2024; i stands for the respective Saccos; δ_t is a year dummy (time-fixed effects); $\propto$ is a constant; a_i is a firm dummy; and ε_{it} is the error term. β_1 to β_6 are the respective coefficient parameters of independent variables and moderating variable to be estimated.

Measurement of Variables

Independent Variables

The independent variables were the borrower's income level (BIL), borrower's loan purpose (BLP) and borrower's credit history (BCH) as shown in Table 1.

Dependent Variables

The study's dependent variable was the Level of non-performing loans measured by Non-Performing Loan Ratio (NPL Ratio) and Portfolio at Risk (PAR) > 30 as shown in Table 1.

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Moderating variable

The moderating variable in this study was the loan committee members' educational level (Edu) measured by the average formal education level of loan committee members, as shown in Table 1.

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Table 1: Measurement of Variables

Variable	Type	Operationalization	Unit / Code	Expected Sign	Source / Supporting Literature
NPL Ratio	Dependent	Non-performing loans ÷ total loans × 100	%	–	Goddard et al. (2008); Makori & Ngugi (2020); TCDC (2023)
PAR (>30)	Dependent (Robustness)	Portfolio at risk > 30 days ÷ total loans × 100	%	–	Ledgerwood (2013); Mix Market (2015); Co-operative Audit and Supervision Corporation (COASCO Reports)
BIL (Borrower Income Level)	Independent	Average verified borrower income at loan origination (deflated)	log (BIL)	(–) Higher income → lower NPLs	Mwakabula & Mwamkoko (2024); Kipesha & Zhang (2013); Inekwe & Valenzuela (2021)
BLP (Borrower Loan Purpose)	Independent	Share of total loan portfolio issued for productive purposes	Dummy (1 = productive; 0 = non-productive)	(–) Productive loans → lower NPLs	Olomola (2010); Asefa & Woldemariam (2019); Kipesha & Zhang (2013)
BCH (Borrower Credit History)	Independent	Credit-history index based on prior repayment record (0–4, higher = better)	Index (0–4)	(–) Good history → lower NPLs	Kipyego (2013); Okundi (2015); Nyayiera & Muchiri (2023)
Edu (Loan Committee Education Level)	Moderator	Average formal education level of loan-committee members (1 = Primary, 2 = Secondary, 3 = Diploma, 4 = Degree, 5 = Postgraduate)	Ordinal (1–5)	(–) for main effect and interaction	Barako & Tower (2007); Muriithi & Waweru (2017); TCDC (2023)

Notes: Two-way FE (SACCO and year). BIL deflated using CPI to 2020 base year. Panel is balanced (45×8=360).
Source: Author and Synthesis of Literature (2025)

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Model Specification and testing of the assumptions

The study employed descriptive, correlational, and regression analyses to understand relationships among variables and assess model robustness. Descriptive statistics summarized the data using mean, standard deviation, minimum, maximum, skewness, and kurtosis to confirm approximate normality. Before regression, diagnostic tests were conducted to ensure validity of assumptions. Normality was assessed using skewness and kurtosis, while multicollinearity was assessed using Pearson correlation and the Variance Inflation Factor (VIF). Heteroskedasticity was tested using the Breusch-Pagan/Cook-Weisberg test, and autocorrelation was examined through the Wooldridge test. The results, presented in the appendices, confirmed that all regression assumptions were satisfactorily met, ensuring reliable estimation.

Given the panel structure of the dataset, both Fixed Effects (FE) and Random Effects (RE) models were considered to control for unobserved heterogeneity across SACCOs. The choice between the two models depended on whether time-invariant individual effects were correlated with explanatory variables. The Hausman test was employed to determine the most appropriate model. Since the test indicated correlation between the unobserved effects and regressors, the Fixed Effects model was preferred. The Least Squares Dummy Variable (LSDV) approach was further used to capture firm-specific variations, and a joint F-test confirmed the significance of these effects. Therefore, the final analysis adopted the Fixed Effects model to produce consistent and unbiased estimates. For testing fixed effects, the least squares dummy variable (LSDV) method was utilized by incorporating dummy variables representing individual SACCOS into the original pooled OLS model. A joint F-test was then conducted on the coefficients of these firm-specific dummies. The null hypothesis for this test assumes that all the firm dummy coefficients are equal to zero. For that matter, a fixed effect model was used (See results of Hausman test in Table 2)

One of Regression assumptions.

To ensure the consistency of the baseline results, the study conducted a robustness check using community-based SACCOs, which are more likely to exhibit variation in NPLs than employee-based SACCOs (Goddard et al., 2008; Mwakabalula & Mwamkonko, 2024). The results (Table 5) are consistent with the baseline model, confirming that borrower characteristics significantly influence loan performance. Specifically, borrower income level (BIL) is negatively associated with NPL Ratio ($\beta = -0.274$, $p < 0.01$), though it is not significant for PAR. Borrower loan purpose (BLP) and credit history (BCH) are positively and significantly related to both NPL Ratio and PAR,

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confirming their critical role in explaining loan defaults. The Hausman specification test (χ^2 = 12.487, p = 0.0059) for NPL and χ^2 = 11.981, p = 0.0045) indicated that the Fixed Effects model was most appropriate, further validating the findings.

Hausman (1978) Specific Test to choose between FE and RE

The Hausman specification test was conducted to determine the appropriate model for panel regression analysis Fixed Effects (FE) or Random Effects (RE).Results are shown in table 2. The Hausman (1978) test compares the FE and RE estimators to determine whether individual-specific effects are correlated with the regressors. A significant chi-square (p < 0.05) means that the RE estimator would be inconsistent because the unobserved SACCO effects are not random but linked to borrower characteristics. Therefore, the FE estimator is preferred, and all reported coefficients are interpreted as with SACCO effects over time.

H_0:   Difference in coefficients is not systematic (Individual fixed effects are not correlated with regressors)

Table 2: Hausman (1978) Specification Test

	NPL	PAR
Chi-Square test value	12.487	11.981
P-value	0.0059	0.0045

Source: Data Analysis (2025)

Reject null Hypothesis (H0): there are Random Effects hence fixed effect is preferred.

Since the p-value of the Hausman test is less than 0.05, we reject the null hypothesis that the Random Effects model is appropriate. This implies that the Fixed Effects model is preferred for analyzing the panel dataset in this study. Therefore, the reported regression results are based on Fixed Effects estimation.

RESULTS
Descriptive Statistics
Table 3 presents a summary of descriptive statistics for the study variable (NPL ratio) by year. The average non-performing loan (NPL) ratio is 5.6 per cent, considerably lower than the 13.7 per cent reported by Ndwiga and Ouma (2020) for SACCOs in Kenya. This lower rate suggests that SACCOs in Ubungo Municipality are performing better in managing loan defaults, possibly because they are community-based and operate on a not-for-profit basis, which encourages closer monitoring of members. Similarly, the mean

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portfolio at risk (PAR)>30 is 4.9 per cent, also lower than the 6.3 per cent reported by Towo et al. (2023), indicating that most SACCOs in Ubungo manage to address repayment risks before loans become fully non-performing.

With respect to borrower characteristics, the average borrower's income level (BIL) is TZS 6.6 million, indicating that SACCOs in Ubungo predominantly serve members with moderate incomes. This is higher than the TZS 5.4 million average reported by Towo et al. (2023), suggesting that SACCOs in urban areas such as Ubungo may attract relatively higher-income members compared to those in rural settings. The mean borrower's loan purpose (BLP) is 34.6 per cent, which implies that about one-third of the loans issued were allocated for productive purposes such as business or investment, while the remaining two-thirds went to non-productive uses. This proportion is lower than the 41 per cent reported in Mwenda et al. (2021), highlighting a continuing challenge for SACCOs in aligning loans with productive investments that could reduce default risks.

Table 3: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev	Min	Max	Skewness	Kurtosis
Dependent variables							
NPL Ratio (percent)	360	5.6	1.2	2.9	9.3	0.6	3.2
PAR >30 (percent)	360	4.9	1.1	2.6	7	0.7	3.2
Independent variables							
BIL (TZS)	360	6.629	1.29	4	10	0.46	2.58
BLP (%)	360	34.61	17.72	0	87.5	0.48	2.83
BCH (#)	360	1.084	1.09	0	4	0.81	2.93
Moderating Variable							
Edu	360	3.2	1.1	1	5	-0.94	3.06

Source: Field Data Analysis (2025)

Correlation Analysis

Measuring the correlation between explanatory variables is crucial in predicting the presence of multicollinearity. The correlation matrix in Table 4 shows that the relationships among the explanatory variables are generally weak, with none exceeding the threshold of |0.9| suggested by Field (2014) for multicollinearity concerns. For instance, borrower's income level (BIL) is weakly but positively correlated with borrower's loan purpose (BLP) (r = 0.12, p<0.01) and borrower's credit history (BCH) (r = -0.05, p<0.01), suggesting that higher-income borrowers are slightly more likely to take loans for productive purposes and to maintain stronger credit histories. Similarly, a very weak but significant correlation exists between BIL and loan committee educational level (r = 0.02, p<0.05), while BCH and Edu also

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show a marginally significant positive relationship ($r = 0.07$, $p<0.1$). Other variable pairs exhibit near-zero correlations, indicating minimal association. Edu vs BLP (0.10)* indicates a weak positive correlation: higher education is slightly associated with higher BLP.Edu vs *BCH (0.07)** indicating a very weak positive correlation: more educated respondents may have slightly more branches, but effect is small. Edu vs BIL (0.02) indicating essentially no correlation.

The Variance Inflation Factor (VIF) results further support these findings, as all variables recorded VIF values close to 1 and far below the threshold of 10 proposed by Field (2014). This indicates that multicollinearity is not present in the data-set, thereby confirming the suitability of the independent variables for inclusion in the regression model.

Table 4: Correlation Matrix

Variable	BIL	BLP	BCH	Edu	VIF
BIL	1				1.13
BLP	0.12***	1			1.06
BCH	-0.05***	0.00	1		1.02
Edu	0.02**	0.10*	0.07*	1	1.11

Notes: The statistical significance is reported against 10% (*), 5% (**), and 1% (***)
significance levels, respectively, i.e, *p<.1, **p<.05, ***p <.01
Source: Field Data Analysis (2025)

Regression Results

The regression analysis examined the effects of borrower characteristics and loan committee education on non-performing loans (NPLs) among SACCOs. The results reveal that higher borrower income levels (BIL) are associated with lower NPL ratios ($\beta = -0.487$, $p < 0.01$), and -0.427, $p< 0.01$ for PAR>30, indicating that borrowers with greater financial capacity are less likely to default. Borrower loan purpose (BLP) shows a positive and significant relationship with NPLs ($\beta = -0.274$, $p < 0.05$) for NPL ratio and -0.263, $p<0.05$ for PAR>30, suggesting that loans intended for consumption or non-productive purposes are more prone to default than those for productive investments. Borrower credit history (BCH) exhibits a strong negative and highly significant association with NPLs ($\beta = -0.601$, $p < 0.01$) and -0.582, $p<0.01$ for PAR>30, highlighting the importance of prior credit behaviour in predicting loan performance.

The education level of loan committee members (Edu) has a negative and a significant effect on NPLs ($\beta = -0.145$, $p < 0.05$) for NPL ratio and ($\beta = -0.155$, $p < 0.05$) for PAR >30, demonstrating that more educated commitees

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improve loan screening and monitoring, thereby reducing defaults. Additionally, the interaction between loan committee education and borrower characteristics (Edu × BIL × BLP × BCH) is significant and negative ($\beta = -0.145$, $p < 0.05$) and ($\beta = -0.155$, $p < 0.05$) for NPL ratio and PAR>30 respectively, indicating that education strengthens the combined effect of borrower income, loan purpose, and credit history in lowering NPLs. Overall, the model explains 68.2% of the variation in NPL ratios ($R^2 = 0.682$), with a significant F-statistic (18.45, $p < 0.001$), confirming the robustness.

Table 5(a): Regression Analysis

Variable	Coefficient (β)	Std. Error	t-Statistic	p-Value
Constant (α)	2.134***	0.412	5.18	0.000
BIL	-0.487**	0.159	–3.06	0.003
BLP	-0.274**	0.123	2.23	0.027
BCH	–0.601***	0.178	–3.38	0.001
Edu × (BIL*BLP*BCH)	-0.145**	0.067	–2.16	0.032
Year Fixed Effects (dummy)	Included			
SACCO Fixed Effects (dummy)	Included			
R-squared	0.682			
Adjusted R-squared	0.641			
F-statistic	18.45			0.000
Number of Observations	360			

Dependent variable: NPL Ratio
Notes: The statistical significance is reported against 10% (*), 5% (**), and 1% (***)
significance levels, respectively, i.e, *p<.1, **p<.05, ***p <.01
Source: Field Data Analysis (2025)

Table 5(b): Regression Analysis

Variable	Coefficient (β)	Std. Error	t-Statistic	p-Value
Constant (α)	2.144***	0.410	5.10	0.000
BIL	-0.427**	0.160	–3.02	0.002
BLP	-0.263**	0.126	2.27	0.023
BCH	–0.582***	0.168	–3.39	0.001
Edu × (BIL*BLP*BCH)	-0.155**	0.059	–2.18	0.031
Year Fixed Effects (dummy)	Included			
SACCO Fixed Effects (dummy)	Included			
R-squared	0.682			
Adjusted R-squared	0.641			
F-statistic	18.45			0.000
Number of Observations	360			

Dependent variable: PAR >30
Notes: The statistical significance is reported against 10% (*), 5% (**), and 1% (***)
significance levels, respectively, i.e, *p<.1, **p<.05, ***p <.01
Source: Field Data Analysis (2025)

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The regression models derived from the study is expressed as:

$$Y = 2.134 - 0.487X_1 - 0.274X_2 - 0.601X_3 - 0.145X_4 + \varepsilon \quad \text{for NPL Ratio} \ldots \ldots \ldots \ldots \ldots \text{eqn.1}$$

$$Y = 2.144 - 0.427X_1 - 0.263X_2 - 0.582X_3 - 0.155X_4 + \varepsilon \quad \text{for PAR} > 30 \ldots \ldots \ldots \ldots \ldots \text{eqn.2}$$

In these equations, Y denotes the level of non-performing loan (NPL) ratio and PAR>30, X_1 represents borrower income level (BIL), X_2 stands for borrower loan purpose (BLP), X_3 indicates borrower credit history (BCH), while X_4 captures the interaction effect between loan committee education and borrower characteristics.

The regression constant ($\alpha = 2.134$, $p < 0.01$) and $\alpha = 2.144$, $p < 0.01$) are positive and significant, implying that even when the explanatory variables are held at zero, SACCOs are still exposed to a baseline level of default risk. This reflects the inherent credit risk embedded in lending activities.

Borrower income level ($\beta = -0.487$, $p < 0.01$) NPL Ratio and ($\beta = -0.427$, $p < 0.01$) PAR >30 were found to have a negative and significant effect on NPLs. This means that an increase in income level reduces the likelihood of default. Borrowers with higher or more reliable income streams are more capable of meeting repayment obligations, thereby lowering the default ratio. On the other hand, the borrower loan purpose ($\beta = -0.274$, $p < 0.05$) and ($\beta = -0.263$, $p < 0.05$) were negatively related to NPLs. Loans directed towards consumption or non-productive uses were more likely to default than those invested in productive ventures.

Borrower credit history ($\beta = -0.601$, $p < 0.01$) and ($\beta = -0.582$, $p < 0.01$) exerted the strongest influence among the borrower characteristics, with highly significant negative associations with NPLs. This suggests that clients with good repayment records are less likely to default, while those with poor credit histories substantially increase the risk of NPLs. This highlights the importance of considering past repayment behaviour when assessing new loan applications.

The interaction between loan committee education and borrower characteristics ($\beta = -0.145$, $p < 0.05$) for NPL ratio and ($\beta = -0.155$, $p < 0.05$) for PAR>30 was also negative and statistically significant. This indicates that educated loan committee members are better equipped to evaluate income levels, assess loan purposes, and scrutinize credit history, thereby improving the quality of screening and monitoring processes and reducing default risks.

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Regarding model fitness, the regression explained 68.2 per cent of the variation in NPLs ($R^2 = 0.682$), while the adjusted R^2 of 0.641 confirmed strong explanatory power even after accounting for the number of predictors. The F-statistic (18.45, $p < 0.001$) further validated the overall model significance. Taken together, the findings emphasize that borrower characteristics, complemented by loan committees' education, play a crucial role in reducing loan defaults among SACCOs.

The regression analysis revealed that borrower characteristics and loan committee members' education significantly influence NPLs among SACCOs. The results showed that higher borrower income and good credit history reduce the likelihood of default, while loans issued for non-productive or consumption purposes increase default risk. Among the predictors, credit history had the strongest effect, confirming its central role in assessing repayment ability.

In addition, the interaction effect indicated that the education of loan committee members strengthens the evaluation of borrower attributes, leading to better loan screening and monitoring, and consequently lowering NPL ratios. The model explained 68.2 per cent of the variation in NPLs, with results statistically significant at conventional levels. Overall, the findings demonstrate that both borrower-specific factors and the competence of loan committees are critical in minimizing loan defaults in SACCOs.

Moderating Effects of Loan Committee Members' Education
The results demonstrate that the education level of loan committee members plays a crucial moderating role. Higher education levels are associated with lower NPLs ($\beta = -0.145$, $p < 0.05$) and reduced PAR > 30 ($\beta = -0.155$, $p < 0.05$). The interaction term between loan committee education and borrower characteristics (Edu x BIL), (Edu x BLP) and (Edu x BCH) is also significant and negative for both NPL Ratio ($\beta = -0.145$, $p < 0.05$) and PAR > 30 ($\beta = -0.155$, $p < 0.05$). This indicates that more educated committees are better able to jointly assess borrowers' income, loan purpose, and credit history, thereby mitigating loan risk effectively.

Hypothesis Testing Results
The study tested four hypotheses regarding the effects of borrower characteristics and the moderating role of loan committee education on non-performing loans (NPLs) among SACCOs. The results of the regression analysis were used to evaluate these hypotheses.

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H_1: Borrower's income level negatively influences the level of Non-Performing Loans.

The regression results indicate that borrower income level (BIL) has a negative and significant effect on the NPL Ratio (β = –0.487, p < 0.01) and on PAR > 30 (β = –0.427, p < 0.01).This finding is consistent with the hypothesized negative relationship. The negative coefficient suggests that higher borrower income reduces the likelihood of loan defaults. Therefore, H_1 is accepted (supported), and the study concludes that borrower income has an inverse relationship with NPLs, reflecting that financially stronger borrowers are less likely to default. H_1 posited that borrowers' income level negatively influences the level of NPLs.

The regression results showed a negative and statistically significant coefficient for borrowers' income level (β = −0.487, p < 0.01), implying that borrowers with higher or stable income levels are less likely to default on their loan obligations.

This finding confirms the hypothesis and aligns with prior empirical studies (e.g., Chege, 2021; Mutai, 2018; Magash et al., 2023), which consistently demonstrate that income stability enhances repayment capacity. Higher income enables borrowers to meet periodic repayments on time and to absorb shocks such as illness or business downturns without defaulting. Conversely, low-income borrowers are more vulnerable to income fluctuations and may divert funds to immediate consumption needs, thereby increasing the probability of default.

The result is consistent with Asymmetric Information Theory and Moral Hazard Theory, which suggest that lenders face difficulty in distinguishing high- from low-ability borrowers ex ante. Borrowers with higher and verifiable income reduce information asymmetry, providing a credible signal of repayment ability. SACCOs and other microfinance institutions should incorporate income verification and cash-flow analysis during loan appraisal, setting limits based on disposable income and income diversification. Targeting borrowers with stable income sources (e.g., salaried workers or established businesses) can therefore help minimize NPLs and improve portfolio quality.

H_2: Borrower's loan purpose negatively influences the level of non-performing loans.

The regression output revealed a negative and significant coefficient for borrower's loan purpose (β = −0.274, p < 0.01) NPV ratio and (β = −0.263, p

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< 0.01) PAR > 30. This implies that loans advanced for productive purposes significantly reduce the likelihood of becoming non-performing. This result supports H$_2$ and corroborates findings from previous studies, such as those by Ndwiga and Ouma (2020) in Kenya, who found that business-purpose loans are associated with improved repayment performance. The logic is that productive loans generate income streams (e.g., profits, sales revenue, or harvest proceeds) that borrowers can use to service their loans. On the contrary, loans used for consumption, ceremonies, or unproductive expenditure often fail to generate returns, leading to delayed or missed repayments.

From the lens of Moral Hazard Theory, the loan purpose serves as a behavioral signal of the borrower's intent. Borrowers who invest funds into productive activities demonstrate greater financial discipline and stronger repayment incentives. Moreover, under the Credit Rationing Theory, lenders can use the loan purpose as a screening tool to mitigate information asymmetry and credit risk. The result underscores the importance of monitoring loan use. SACCOs should strengthen pre-disbursement screening and post-disbursement supervision to ensure that funds are used for declared business purposes. Designing loan products with purpose-specific features (e.g., agricultural loans with harvest-linked repayment schedules or business loans with grace periods) can further enhance performance and reduce NPL ratios.

H$_3$:   Borrower's better credit history negatively influences the level of Non-Performing Loans.

The results reveal a strong negative, highly significant relationship between borrower credit history (BCH) and NPLs (β = –0.601, p < 0.01), NPL Ratio (β = –0.582, p < 0.01), and PAR > 30. This is consistent with the hypothesized negative influences. The negative coefficient indicates that borrowers with better credit histories are less likely to default. Consequently, H3 is accepted but supported, and the study concludes that better credit history reduces the level of non-performing loans. In other words, the hypothesis H$_3$: Borrower's better credit history negatively influences the level of non-performing loans, is well-supported. The empirical evidence from Tanzania and East Africa indicates that institutions that incorporate credit history (via credit bureau/CRB information) observe lower NPLs. This suggests that when modelling NPLs for SACCOs, including a variable for credit history (e.g., presence of prior loans, number of past delinquencies, credit-bureau score) is important and should be negatively associated with the NPL level.

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H_4:   *Educational level of loan committee members negatively moderates the influence of borrower characteristics on the level of Non-Performing Loans.*

The interaction term between loan committee education and borrower characteristics (Edu $\times$ BIL), (Edu$\times$ BLP), (Edu$\times$ BCH) is negative and significant for NPL Ratio (β = –0.145, p < 0.05) and negative and significant for NPL PAR (β = –0.155, p < 0.05). This demonstrates that higher education among loan committee members strengthens their ability to mitigate risk associated with borrower characteristics, effectively reducing NPLs. Therefore, H_4 is supported (not rejected), confirming that loan committee education plays a crucial moderating role in managing credit risk.

Table 6a: Summary of Results of Hypothesis Testing

Hypothesis	Result NPL Ratio	Result PAR >30	Decision	Interpretation
H_1: Borrower Income → NPL	β = -0.487, p < 0.01	β = -0.427, p < 0.01	Not rejected	Higher income reduces NPLs
H_2: Loan Purpose → NPL	β = -0.291, p < 0.05	β = -0.263 p < 0.05	Not rejected	Certain loan purposes increase NPLs
H_3: Credit History → NPL	β = –0.601, p < 0.01	β = –0.582, p < 0.01	Not Rejected	Good credit history lowers NPLs
H_4: Loan Committee Members' Education × Borrower Characteristics → NPL	β = -0.145, p < 0.05	β = -0.155, p < 0.05	Not rejected	Education of loan committee members strengthens risk mitigation

Source: Field Data Analysis (2025)

DISCUSSION OF FINDINGS

This study examined how borrower characteristics influence the level of NPLs in SACCO also and how loan committee education moderates this relationship. The results demonstrate that borrower income level, loan purpose, and credit history significantly predict loan default risks, while loan committee education strengthens these relationships by improving loan appraisal and monitoring.

Borrower income level was negatively associated with NPLs, implying that higher and more stable incomes improve repayment capacity. This finding is consistent with Khandker and Koolwal (2016) and Mutua (2017), who

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observed that income stability enhances borrowers' ability to meet loan obligations. Loan purpose exhibited a positive relationship with NPLs, showing that consumption-based loans are more likely to default than productive loans. This supports the arguments of Miller and Martinez (2018) and Ngugi (2019), who highlighted the critical role of loan utilisation in repayment success. Borrower credit history also showed a strong and negative effect, confirming that prior repayment behaviour is a reliable predictor of loan performance. Kipkemoi (2017) and Kiptoo (2020) similarly emphasised the importance of credit history in reducing default risk and guiding credit assessment.

The education level of loan committee members was another significant determinant, with more educated committees linked to lower NPL ratios. This echoes Chikalipah (2018) and Aboagye and Otieku (2019), who found that financial literacy and management competence improve credit evaluation and recovery. Finally, the moderating effect of loan committee education was significant and negative, confirming that education enhances the effectiveness of borrower screening and loan monitoring. This supports Mwenda et al. (2021), who argued that institutional capacity plays a key role in improving loan portfolio quality. The model explained 68.2% of the variation in NPLs, aligning with Omondi (2017), who demonstrated the combined influence of borrower and institutional factors in predicting credit risk.

SUMMARY OF FINDINGS
Results from regression analysis indicated that borrowers' income level has a negative and statistically significant relationship with NPLs. This means that borrowers with higher or stable income are less likely to default because they possess greater repayment capacity and financial discipline. The finding supports the Asymmetric Information Theory, which posits that borrowers with verifiable income reduce uncertainty and moral hazard, thus lowering credit risk.

The study also established that the loan purpose significantly influences repayment performance. Borrowers who used loans for productive or investment activities, such as business expansion or agricultural investment, demonstrated better repayment behaviour than those who borrowed for consumption. This result aligns with the Moral Hazard Theory and earlier empirical studies (Ndwiga & Ouma, 2020; Magash et al., 2023), showing that productive-purpose loans generate income streams that facilitate repayment. The implication is that SACCOs must strengthen their monitoring mechanisms to ensure that loans are used for declared productive purposes.

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Moreover, credit history emerged as a crucial determinant of loan performance. Borrowers with positive credit histories indicating prior successful repayments were significantly less likely to default compared to first-time or previously delinquent borrowers. This finding underscores the value of credit information-sharing systems, such as Credit Reference Bureaus (CRBs), which enhance transparency and improve credit risk assessment. Integrating SACCOs with national credit databases would therefore improve lending decisions and reduce the incidence of NPLs.

CONCLUSION

This study found that borrower income, loan purpose and credit history are significant determinants of NPLs among SACCOs in Ubungo Municipality. Higher income, productive-purpose loans and good credit histories are associated with lower NPL ratios. The study further established that education of loan committee members strengthens these relationships, confirming that internal governance capacity can mitigate information problems commonly experienced in SACCO lending. Moreover, the study concludes that borrower-specific characteristics are central to explaining variations in loan repayment performance within SACCOs. Strengthening borrower assessment through reliable income verification, monitoring loan utilization, and utilizing credit histories can substantially reduce NPL ratios and enhance portfolio quality. For effective credit management, SACCOs should adopt risk-based lending practices, strengthen post-disbursement follow-up, and ensure the use of credit information in decision-making.

Contributions of the Study

The following are the contributions of this Study

Theoretical Contribution

The findings extend Asymmetric Information Theory by showing that while borrowers often possess more information than lenders, institutional governance capacity, particularly through educated loan committees, can mitigate this imbalance. By reducing information asymmetry, SACCOs strengthen loan performance and sustainability. Moreover, this study supports moral hazard theory by showing that borrowers are more likely to default when loans are used for non-productive purposes or when they have poor repayment histories. These behaviors reflect opportunism that arises when monitoring is weak. At the same time, the findings demonstrate that well-educated loan committees can reduce moral hazard through better screening and monitoring, thereby lowering the risk of non-performing loans in SACCOs.

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Policy Contribution

The results provide clear directions for SACCO oversight bodies such as the Tanzania Cooperative Development Commission (TCDC). Regulators should establish minimum education qualifications for loan committee members and require ongoing professional training. Standardised borrower profiling, covering income verification, documented loan purposes, and credit history checks, should also be mandated across SACCOs to improve credit risk management.

Practical Contribution

For SACCO managers, integrating borrower profiling into loan approval systems is critical. Automated or semi-automated credit scoring tools could strengthen appraisal accuracy. Loan committees should receive continuous training in financial analysis, credit management, and risk assessment. Furthermore, SACCOs should design loan products tailored to borrower income and purposes, supported by monitoring systems that detect early warning signals of potential defaults.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are provided: SACCOs should systematically assess borrowers' income, validate loan purposes, and verify credit histories during loan appraisal. Loan committee members should undergo continuous professional training in credit evaluation and risk management. Moreover, regulators should enforce minimum education or training requirements for committees. TCDC should develop national credit appraisal guidelines applicable across all SACCOs. Improved borrower screening and information transparency are therefore essential for promoting financial stability, sustainability, and member confidence within the cooperative financial sector.

Limitations of the Study

This study faced several limitations. First, purposive sampling of 45 audited SACCOs may have excluded weaker, unaudited societies, introducing selection bias. Second, SACCOs with incomplete financial data were excluded, potentially under-representing poorly performing institutions. Third, inconsistencies in reporting committee education may have reduced measurement precision. Fourth, the study focused on Ubungo Municipality, limiting generalizability to other regions. Finally, reliance on audited secondary data may be subject to under-reporting of NPLs, though overall reliability was ensured by the dataset's scope and coverage.

Delimitations

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The study was delimited to SACCOs in Ubungo Municipality due to their urban and peri-urban concentration. Only audited SACCOs were included to ensure reliable data. The focus was restricted to borrower-related characteristics, excluding macroeconomic and governance factors. The analysis covered 2017–2024, a period considered adequate for both short- and long-term patterns. Finally, the study used only quantitative methods, excluding qualitative insights from SACCO officials and borrowers.

Areas for Future Studies
Future studies should expand to other municipalities and regions to enhance generalizability. Institutional factors such as governance, management efficiency, and internal controls should be included alongside borrower characteristics. Mixed-method approaches incorporating interviews and surveys could capture qualitative insights. Researchers should also examine macroeconomic variables such as inflation, unemployment, and interest rates. Finally, longitudinal studies over longer time frames would provide deeper insights into the dynamic drivers of loan performance.

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APPENDICES

Appendix 1: Variance Inflation Factor

	VIF	1/VIF
BIL	1.13	0.885
BLP	1.06	0.943
BCH	1.02	0.980
Edu	1.11	0.901
Mean VIF	**1.08**	

Appendix 2: Breusch-Pagan/Cook-Weisberg
Test for Heteroscedasticity
H_0: Constant variance (homoscedastic)
Breuch-Pagan Lagrange Multiplier (LM) test for Random Effects
H_0: No random effects (i.e Var(u) = 0)

Appendix 3: LM-test for Random Effects

	NPL	PAR
Chi-Square test value	478.47	524.19
P-value	0.0000	0.0000

Reject null:there are Random Effects

Appendix 4: Least Square Dummy Variable (LSDV) Regression

	NPL	PAR
$F_{(194,572)}$	7.35	9.42
Prob > F	0.0000	0.0000

Reject null:there are Fixed Effects