

**MAKERERE**



**UNIVERSITY**

**DETERMINANTS OF CREDIT ACCESS IN UGANDA**

**BY**

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**A RESEARCH REPORT SUBMITTED TO THE DIRECTORATE OF RESEARCH AND  
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## DECLARATION

I, Babanza Suzan declare that this research report entitled, "Determinants of credit access in Uganda" is my original work and has never been submitted for any other degree-awarding institution.

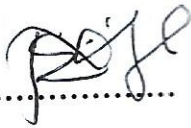
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## APPROVAL

This research report has been submitted for examination with my approval as the university supervisor

Signature ..... 

Date..... 9/01/2026

**Dr. Aggrey Niringiye**

## **DEDICATION**

I dedicate this research paper to my parents Mr. Asaph and Mrs Jovety Ahimbisibwe.

## ACKNOWLEDGEMENT

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## LIST OF ABBREVIATIONS

|         |  |
|---------|--|
| ACF     | Agricultural Credit Facility                           |
| AUC     | Area Under the Curve                                   |
| BOU     | Bank of Uganda   |
| EA      | Enumeration Area                                       |
| FSDU    | Financial Sector Deepening Uganda                      |
| GSMA    | Global System for Mobile Communications Association    |
| IFC     | International Finance Corporation                      |
| LPM     | Linear Probability Model                               |
| MAAIF   | Ministry of Agriculture, Animal Industry and Fisheries |
| MFI     | Microfinance Institution                               |
| MDI     | Microfinance Deposit-Taking Institution                |
| MoFPED  | Ministry of Finance, Planning and Economic Development |
| MNL     | Multinomial Logit Model                                |
| MSMEs   | Micro, Small and Medium Enterprises                    |
| NDP III | National Development Plan III                          |
| NFIS    | National Financial Inclusion Strategy                  |
| PDM     | Parish Development Model                               |
| ROC     | Receiver Operating Characteristic                      |
| ROSCA   | Rotating Savings and Credit Association                |
| SACCO   | Savings and Credit Cooperative Organization            |
| SDGs    | Sustainable Development Goals                          |
| UBOS    | Uganda Bureau of Statistics                            |
| UGX     | Uganda Shilling  |
| UMRA    | Uganda Microfinance Regulatory Authority               |
| UNCDF   | United Nations Capital Development Fund                |
| UNHS    | Uganda National Household Survey                       |
| UCB     | Uganda Commercial Bank                                 |
| VSLA    | Village Savings and Loan Association                   |
| VIF     | Variance Inflation Factor                              |
| WHO     | World Health Organization                              |
| YLP     | Youth Livelihood Program                               |

## ABSTRACT

This study examines the determinants of household credit access in Uganda using nationally representative data from the Uganda National Household Survey (UNHS) 2019/2020. A weighted sample of 13,645 households was analyzed using survey-adjusted binary logistic regression to estimate overall credit access and a multinomial logit model to distinguish between formal, informal, and no credit outcomes.

Only 22.8% of households accessed credit, with 4.8% borrowing formally and 13.7% informally. Key determinants were education, income, household size, and VSLA/SACCO membership. Post-secondary education increased the probability of access by about 8 percentage points, while VSLA/SACCO membership had the strongest effect, raising access by 17.5 percentage points. Higher household income also increased access (marginal effect: 0.014). In contrast, older age ( $-0.088$ ) and urban residence ( $-0.037$ ) reduced the likelihood of borrowing. Regional disparities were significant, with households in Eastern Uganda more likely and those in Northern Uganda less likely to access credit.

Robustness checks including alternative model specifications and diagnostic tests confirmed the reliability of the results. Key limitations include the cross-sectional design and limited capture of digital credit.

The study recommends strengthening rural financial infrastructure, expanding digital and group-based lending, and promoting financial literacy to improve inclusive access to credit.

## **CHAPTER ONE: INTRODUCTION**

### **1.1 Background of the Study**

Access to credit is essential for strengthening household welfare, stimulating entrepreneurship, and promoting inclusive economic growth, particularly in developing economies such as Uganda. Globally, approximately 68% of the population relies on credit for household consumption, investment, and rural development, Qureshi et al., (2014). Credit can be used for productive activities or consumption smoothing, Jain & Parveen, (2014), making it a vital tool for economic resilience.

In Uganda, credit supports investment, agricultural production, and micro-enterprise growth. Despite financial sector expansion, government programs, and digital transformation, credit access remains limited, especially among rural residents, women, youth, and informal sector workers UBOS (2024); MoFPED, (2023). The Uganda National Household Survey (UNHS 2019/2020) shows that credit access remains low and uneven, with most households relying on informal lenders, VSLAs, or family networks rather than formal institutions.

Information asymmetries also limit lending, resulting in risk-averse practices and credit rationing (Stiglitz & Weiss, 1981). These constraints disproportionately affect low-income and rural households, explaining continued dependence on informal lenders such as VSLAs, moneylenders, and social networks FSDU (2018); UMRA (2023). Government initiatives such as the Agricultural Credit Facility (ACF), Parish Development Model (PDM), and Youth Livelihood Programme (YLP) aim to address these barriers MoFPED, (2023), but access still varies widely across demographic and regional groups.

Given these dynamics, this study seeks to analyze the socio-economic, demographic, and institutional determinants of credit access in Uganda using the UNHS 2019/2020 dataset.

### **1.2 Uganda's Financial Sector Development**

Uganda's financial sector has expanded significantly over the past three decades due to liberalization, technological innovation, and targeted financial inclusion policies BoU, (2023). The sector consists of commercial banks (Tier I), credit institutions (Tier II), microfinance deposit-taking institutions (Tier III), and non-deposit-taking MFIs and

SACCOs regulated by UMRA (Tier IV). These institutions play central roles in savings mobilization, credit allocation, and risk management, Levine, (1997).

As of 2023, Uganda had 25 commercial banks, 5 credit institutions, and 4 MDIs BoU, (2023; UMRA, 2023). Digital financial services especially mobile money and agent banking have expanded financial outreach, with over 40 million registered mobile money accounts (GSMA, 2023). Despite these gains, formal institutions remain concentrated in urban areas, contributing to persistent rural financial exclusion Beck & Cull, (2013), UBOS, (2024).

### **1.3 Commercial Banking Sector**

Uganda's commercial banking sector remains central to credit allocation but has historically been characterized by risk-averse lending practices (Beck & Hesse, 2009). Banks tend to favor formal enterprises and salaried individuals, largely due to concerns about enforcement risk, borrower information gaps, and collateral requirements conditions consistent with the Credit Rationing Theory Stiglitz & Weiss, (1981).

Agriculture employs over 60% of Uganda's labor force but receives less than 10% of total commercial bank credit due to perceived risks such as seasonality and price volatility (UBOS, 2024). High lending rates averaging 18%–24% further discourage borrowing (BoU, 2023). Consequently, many households rely on informal credit from VSLAs, moneylenders, and family networks FSDU, (2018).

### **1.4 Problem Statement**

Access to credit remains limited in Uganda despite financial sector reforms, digital innovations, and targeted government programs. Evidence from the UNHS 2019/2020 indicates that only a small proportion of households obtain credit from formal institutions, with most relying on informal lenders or lacking access to credit altogether . Persistent constraints include high collateral requirements, information asymmetry, limited rural financial infrastructure, high interest rates, and low financial literacy BoU, (2023);UMRA, (2023).

Existing studies on Uganda's credit markets have several limitations. Many rely on outdated datasets, omit distinctions between formal and informal credit, or fail to incorporate digital financial developments Beck & Cull, 2013; FSDU, (2018). Few studies analyze regional

disparities or integrate social capital and financial technology variables. These gaps limit the evidence base for designing effective financial inclusion strategies.

This study therefore addresses these gaps by using the UNHS 2019/2020 to examine the socio-economic, demographic, and institutional determinants of credit access, with explicit differentiation between formal and informal credit sources and attention to regional disparities. The findings aim to inform targeted financial inclusion strategies and support equitable access to credit across Uganda.

## **1.5 Research Objectives**

### **1.5.1 Main Objective**

To examine the determinants of credit access in Uganda.

### **1.5.2 Specific Objectives**

- i) To identify socio-economic, demographic, and institutional factors influencing household credit access.
- ii) To examine determinants of formal credit access.
- iii) To analyze determinants of informal credit access.
- iv) To assess rural–urban and regional disparities in credit access.

## **1.6 Research Questions**

### **1.6.1 Main Research Question**

What are the key determinants of credit access in Uganda?

### **1.6.2 Specific Questions**

- i) Which socio-economic, demographic, and institutional factors influence credit access?
- ii) What factors determine access to formal credit?
- iii) What factors determine access to informal credit?
- iv) How do rural–urban and regional disparities shape credit access?

## **1.7 Justification of the Study**

This study supports Uganda’s Vision 2040, National Development Plan III, and the National Financial Inclusion Strategy MoFPED, (2017). By identifying gaps in formal and informal credit access, the study informs evidence-based policies aimed at inclusive financial development.

The study contributes to academic literature by empirically testing Credit Rationing Theory Stiglitz & Weiss, (1981), Human Capital Theory Becker, (1964), and Transaction Cost Theory Coase, (1937) using the 2019/2020 UNHS data. It also incorporates digital finance and social capital variables that have been overlooked in earlier studies GSMA, (2023); UNCDF, (2023). This strengthens understanding of modern credit dynamics in Uganda. This study supports Uganda’s Vision 2040, the National Development Plan III, and the National Financial Inclusion Strategy (2017–2022), all of which prioritize broadening access to financial services. By identifying the factors that influence credit access especially among underserved groups the study contributes to efforts aimed at promoting equitable financial inclusion.

The study advances academic knowledge by testing Credit Rationing Theory using the UNHS 2019/2020 dataset and by distinguishing between formal and informal credit markets. It also highlights spatial disparities and institutional realities that shape financial inclusion in Uganda. Findings will guide policymakers, financial institutions, and development partners in designing targeted interventions to expand access to affordable and inclusive credit.

## **1.8 Organization of the study**

This study is organized into five chapters, each of which contributes to developing a coherent understanding of the research problem and its policy implications.

Chapter One introduces the study by providing the background and context within which the research is situated. It clearly states the research problem, outlines the objectives and research questions, and highlights the justification of the study. This chapter establishes the foundation and rationale for undertaking the research.

Chapter Two reviews the relevant theoretical and empirical literature. The theoretical review discusses key concepts and frameworks that guide the study, while the empirical review

synthesizes previous studies, identifying both consistencies and gaps in knowledge. This chapter positions the current research within the broader academic discourse and demonstrates the contribution it seeks to make.

Chapter Three describes the methodology employed in the study. It details the data sources, variable definitions, and model specifications used in the analysis, data handling, robustness strategy. In addition, it explains the estimation techniques and justifies their suitability for answering the research questions. This chapter ensures transparency and replicability of the research process.

Chapter Four presents and analyzes the empirical findings. It provides a systematic presentation of the results, complemented by post-estimation tests to ensure robustness. The discussion in this chapter links the findings to the objectives of the study and to the literature reviewed in Chapter Two, thereby demonstrating how the research advances knowledge and addresses the identified gaps.

Chapter Five concludes the study by summarizing the main findings and drawing out their implications. It highlights the key contributions of the research, both academically and practically, and puts forward policy recommendations informed by the results. This chapter also suggests areas for further research, underscoring the study's role in stimulating continued inquiry into the topic.

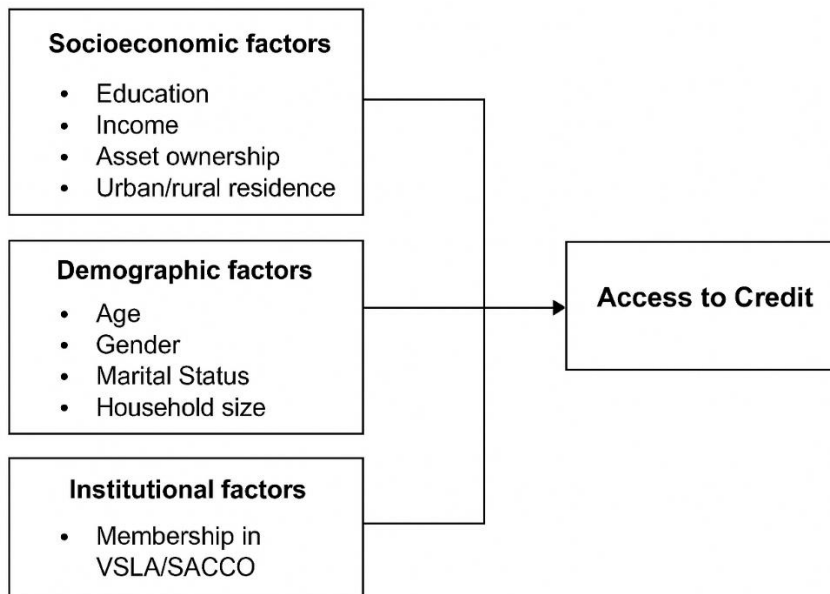
## **1.9 Conceptual Framework**

This study is guided by a conceptual framework that links demographic, socio-economic, and institutional factors to household access to credit.

The framework is grounded in Credit Rationing Theory Stiglitz & Weiss, (1981), Human Capital Theory Becker, (1994), Life-Cycle Hypothesis Modigliani & Brumberg, (1954), Social Capital Theory Coleman, (1988), and Transaction Cost Theory Williamson, (1985).

The central assumption is that households decide whether or not to access credit based on their expected utility from borrowing, constrained by information asymmetry, collateral availability, income stability, and institutional access.

**Figure 1. 1: Conceptual framework**



The conceptual framework illustrates how demographic, socio-economic, and institutional variables jointly influence household access to credit. Demographic characteristics such as age, gender, marital status, and household size shape financial behavior and borrowing needs. Socio-economic factors including education, income, asset ownership, and residence affect creditworthiness, repayment capacity, and transaction costs. Institutional factors such as VSLA/SACCO membership and regional location moderate access through information flows, social capital, and proximity to financial infrastructure.

Collectively, these factors are expected to influence the likelihood that a household will access formal or informal credit, consistent with the Human Capital Theory, Social Capital Theory, Credit Rationing Theory, and Transaction Cost Theory.

## CHAPTER TWO: LITERATURE REVIEW

### 2.1 THEORETICAL LITERATURE REVIEW

The theory of credit rationing Stiglitz and Weiss (1981), explains why borrowers with seemingly viable projects may be denied loans despite the presence of credit demand. It argues that asymmetric information between lenders and borrowers, banks engage in credit rationing to avoid adverse selection and moral hazard. This is relevant in Uganda, where many individuals operate in informal markets and lack credit histories, information asymmetry is pronounced, particularly among rural farmers and informal sector workers. This results in lenders demanding high collateral, rejecting riskier borrowers, or rationing credit BoU, (2023); Beck & Hesse, (2009). The strength of this theory is that explains structural exclusion in developing credit markets, highlights why many creditworthy Ugandans remain unserved. However, its weakness is it doesn't account for the rise of digital finance, which leverages mobile money data to partially overcome information asymmetries. This study addresses the gap by incorporating digital financial services as an emerging mechanism for expanding credit access.

Social Capital Theory, Coleman (1988); Putnam (1993) postulates that networks, relationships, and social norms enable individuals to access resources, including credit. In contexts where formal financial systems are underdeveloped, social networks serve as a key mechanism for informal credit access. This is relevant in Uganda, where Village Savings and Loan Associations (VSLAs) and SACCOs operate primarily based on trust and community ties, often extending credit to members without formal collateral. The strength of the theory is it explains why informal financial systems remain strong, especially in rural areas. It also accounts for the role of community trust where formal institutions are limited. Its limitation, however, is that reliance on trust can exclude non-members, migrants, or marginalized groups. This study addresses the gap by exploring how formal institutions and fintech solutions complement or substitute for social networks in enhancing credit access.

Financial Intermediary Theory explains the role of financial institutions in bridging the gap between savers and borrowers. According to this theory, financial intermediaries reduce the transaction costs, mitigate information asymmetries, and facilitate efficient allocation of resources. Levine, (1997). This is relevant in Uganda, where informal financial markets dominate, formal intermediaries such as banks, microfinance institutions and SACCOs play a crucial role in increasing credit access. The strength of the theory is that it helps explain

why proximity to financial institutions and membership in savings groups often enhance credit access in Uganda. It's also useful for understanding institutional credit dynamics. The weakness of the theory is it assumes intermediaries are efficient and accessible, which is not always the case in Uganda's rural areas. This study addresses the gap by analyzing how both traditional and digital intermediaries affect credit access

Transaction Cost Theory, Coase,(1937); Williamson (1981) suggests that access to credit is influenced by the cost of obtaining, processing, and monitoring loans. This is relevant in Uganda especially rural Uganda, where high transaction costs including transport to financial institutions, time lost from work, and bureaucratic delays discourage both borrowers and lenders. The strength of the theory is, it helps explain why proximity to financial institutions is a key determinant of credit access and why geographic location significantly affects loan availability. It also captures rural financial exclusion, its weakness is, it overlooks the potential of digital finance to reduce these costs. This study addresses the gap by examining whether mobile credit services mitigate transaction barriers for rural populations.

Human Capital Theory Schultz (1961); Becker (1964) emphasizes that education enhances an individual's productivity, decision-making ability, and ability to manage resources effectively. In the context of credit markets, education improves financial literacy, risk assessment, and the ability to navigate complex loan procedures. The theory is relevant in Uganda, where educated individuals are more likely to understand application procedures, provide necessary documentation, and engage with digital financial services, thus increasing their chances of obtaining credit from commercial banks and microfinance institutions UBOS, (2024). The strength of the theory is it explains the positive effect of education on financial literacy and documentation ability.. However, the weakness of the theory is it underplays structural barriers such as gender inequality and collateral requirements, which education alone cannot resolve. This study addresses the gap by analyzing education alongside institutional and demographic determinants

## **2.2 EMPIRICAL LITERATURE REVIEW**

Education is a key factor affecting credit access. Recent Ugandan analyses UBOS, (2021); Finscope, (2018) confirm that higher education is associated with greater formal credit use, though informal credit remains dominant among the less educated. However, These studies provide national insights but do not statistically model how education interacts with digital

finance or gender gaps. Several international studies have shown that education increases access to formal credit. Zeller (1994) found that educated borrowers in Bangladesh had a higher likelihood of obtaining credit from formal lenders. While these findings align, they rely on different methods, Zeller applied probit regression, whereas UBOS used national household survey tabulations making it difficult to assess the strength of causality. Moreover, few studies examine whether education interacts with digital financial services, leaving a gap this study addresses.

Geographical disparities in credit access remain significant in Uganda. Urban dwellers have better access to banks, microfinance institutions (MFIs), and mobile money services compared to rural residents, who often travel long distances to reach financial service points. According to UBOS (2024), only 9% of rural households in Uganda reported obtaining credit from commercial banks, compared to 23% in urban areas. However, foreign studies like Diagne et al., 2000 on Mali suggest that while rural disadvantage is widespread, the magnitude differs by context. These differences point to the need for Uganda-specific analysis, especially on how financial innovations like mobile money reshape rural access, a gap that this research addresses by providing these estimates.

Income level is consistently identified as a strong determinant of access to credit. Higher-income individuals and households are more likely to be considered creditworthy by financial institutions. UBOS (2021; 2024) household surveys show higher credit uptake among salaried workers and urban non-farm enterprises. Agricultural households remain largely constrained due to seasonality. Similarly, Foreign studies like Diagne et al. (2000) show that income variability reduces the likelihood of accessing credit, particularly in agricultural households that face seasonal income flows. While the direction of the effect is consistent, methodological differences, bank-level data vs. household survey vs. perception surveys produce varying estimates of how much income matters, suggesting inconclusiveness on the magnitude of the relationship which this study addresses.

Gender disparities in credit access have been documented across various studies. Finscope Uganda (2018) highlighted that 78% of women in Uganda access credit through informal mechanisms like VSLAs and family networks, compared to 54% of men. Foreign studies such as D'Espallier, Guérin & Mersland (2013), using global microfinance data, found that women are more rationed because they lack collateral and face discriminatory lending behavior. Fletschner (2009) also showed that women's limited control over assets reduces

their creditworthiness in Latin America. These findings are consistent across time and regions, but datasets differ, earlier studies were small-scale field surveys, while recent ones use nationally representative data. This raises questions about comparability and whether the gender gap is narrowing with financial inclusion policies an area this study explores.

Age is another important demographic factor. Foreign studies like Zeller (1994), explains that middle-aged individuals typically 30–50 years are more likely to access formal credit due to their economic stability and creditworthiness. In contrast, younger individuals are often excluded due to a lack of credit history and insufficient collateral. Marital status also matters; married individuals may be perceived as more stable borrowers. Diagne et al. (2000) found that married households in rural Mali had higher access to microcredit, particularly through group lending schemes. However, household size shows mixed evidence, Rosenzweig & Wolpin (1993) argue larger households demand more credit, while UBOS (2018) finds they are often perceived as higher-risk. This inconsistency suggests the need for further analysis using recent Ugandan data, which this study provides.

### **Digital Finance, mobile money credit, Fintech developments post 2018 in Uganda**

Digital finance and credit access. Recent policy and industry diagnostics show that Uganda’s digital finance ecosystem has moved beyond basic payments to increasingly support credit delivery. UNCDF’s country review (2023) explains the rapid emergence of digital credit products in Uganda, largely short-term consumer loans alongside concerns about high costs, over-indebtedness, and limited product design for low-income borrowers. Finscope (2018) notes increasing mobile-money enabled borrowing but does not evaluate determinants of digital credit uptake. Foreign studies like GSMA’s industry reports (2020–23) substantiate fast mobile-money uptake and rising integration of wallets with loan distribution, which creates new “digital footprints” that lenders can use for alternative credit scoring (GSMA, 2023). However, this is uneven and with important consumer-protection challenges.

Fintech developments. Country market studies and supply-side analyses (IFC, (2021); Uganda Bankers/industry notes, (2024) explain that fintech entrants and telco-bank partnerships are experimenting with algorithmic underwriting using mobile transaction histories, airtime/top-up data, and agent networks to underwrite small loans to previously excluded segments like the youth, micro-entrepreneurs. Empirical evidence shows that such alternative scoring increases short-term credit take-up but raises questions about pricing

transparency and borrower vulnerability; Uganda-specific market research highlights rapid product experimentation but limited rigorous, nationally representative econometric evidence on who receives digital loans and how that changes formal vs. informal credit patterns. This leaves a gap that this study addresses.

Mobile money remains the most pervasive digital financial entry point in Uganda, supported by wide agent networks and USSD functionality that reaches basic-phone users. UNCDF work show that mobile money enables rapid disbursement and repayment of micro-loans and that, in some segments, mobile-based loans now account for a growing share of new small loans (GSMA, (2023)). However, randomized and quasi-experimental studies caution that agent rollout alone does not automatically translate into sustained financial inclusion or productive credit use adoption and impact depend on demand-side factors like digital literacy, cash liquidity at agents and supply-side product design. These nuanced findings highlight why the UNHS analysis should include interaction terms like education vs mobile-money use and regional subsamples

### **Overview of the Literature Review**

The literature shows that credit access in Uganda is shaped by individual characteristics, geographic location, and institutional constraints. Stiglitz and Weiss's (1981) credit rationing theory explains how imperfect information leads lenders to rely heavily on collateral and formal employment, limiting access for informal and low-income borrowers Bank of Uganda, (2023). Human capital theory Becker, (1964) further supports the role of education and age in influencing borrowing decisions.

Empirical studies consistently find that income, education, age, gender, and employment type significantly determine credit access. UBOS (2024) reports that households with higher education and income levels are more likely to access formal loans. Women continue to face barriers stemming from low asset ownership and cultural restrictions (Financial Sector Deepening Uganda, (2018); Mayada et al., (1994)).

Geographic disparities also persist. Rural households experience lower access to formal financial services due to weak infrastructure and high transaction costs, driving reliance on informal sources such as VSLAs Beck & Hesse, 2009; Udry, (1994). Institutional constraints including stringent collateral requirements, high interest rates, and limited financial literacy further restrict access, consistent with the credit rationing framework Uganda Microfinance Regulatory Authority (2023)

**Table 2. 1 Literature review summary table**

| <b>Theory / Author(s)</b>                           | <b>Key Concepts</b>  | <b>Strengths</b>   | <b>Weaknesses</b>  | <b>Research gap/ how the study addresses it</b>  |  |
|---|--|--|--|--|--|
| Credit Rationing Theory (Stiglitz & Weiss, 1981)    | Explains why viable borrowers are denied loans due to asymmetric information; highlights adverse selection and moral hazard. | Captures structural exclusion and why collateral matters; relevant for developing countries. | Does not consider digital finance solutions that mitigate information asymmetry.                           | Effect of digital finance on overcoming traditional rationing not addressed. This study includes mobile-money and fintech variables to examine credit access.      |  |
| Social Capital Theory (Coleman, 1988; Putnam, 1993) | Networks, trust, and social norms facilitate informal credit access (e.g., VSLAs, SACCOs)                                    | Explains informal credit resilience in rural areas; highlights community mechanisms.         | Excludes marginalized groups, migrants, or those outside networks; does not address formal/digital credit. | Interaction of social networks with formal institutions and fintech. This study explores complementarities/substitution between social capital and digital credit. |  |

|   |  |  |  |  |  |
|---|--|--|--|--|--|
| Financial Intermediary Theory (Levine, 1997)            | Financial institutions reduce transaction costs and information asymmetries; facilitate efficient credit allocation. | Useful for understanding formal institutional credit dynamics in Uganda. | Assumes intermediaries are efficient and accessible, which is often not true in rural areas. | Role of digital intermediaries in enhancing access. This study analyzes both traditional and digital intermediaries.               |  |
| Transaction Cost Theory (Coase, 1937; Williamson, 1981) | Access to credit is influenced by the costs of obtaining, processing, and monitoring loans.                          | Explains rural exclusion and geographic disparities in credit access.    | Overlooks digital finance's potential to reduce costs.                                       | Impact of mobile money and digital loans on reducing transaction costs; study integrates digital credit variables.                 |  |
| Human Capital Theory (Schultz, 1961; Becker, 1964)      | Education enhances productivity, financial literacy, and decision-   | Explains why education correlates with formal credit access.             | Does not address structural barriers such as gender or collateral constraints.               | Interaction between education and fintech adoption. Study examines education alongside digital credit and institutional variables. |  |

|                             |                                   |  |   |   |  |
|-----------------------------|-----------------------------------|--|---|---|--|
|                             | making in credit use.             |  |   |   |  |
| <b>EMPIRICAL LITERATURE</b> |                                   |  |   |   |  |
| <b>Author(s) &amp; Year</b> | <b>Context / Data / Method</b>    | <b>Key Findings</b>  | <b>Strengths</b>                                | <b>Weaknesses</b>                                     | <b>Research gap/How study addresses it</b>                                     |
| UBOS (2018, 2021)           | Uganda, national household survey | Majority rely on informal credit; urban-rural disparity exists                               | Nationally representative                       | Limited focus on digital credit                       | Include fintech/mobile-money variables to capture new digital access channels. |
| Beck & Hesse (2009)         | Uganda, bank-level survey data    | Banks lend mainly to formal, salaried clients; low-income households rely on informal credit | Highlights income effect and institutional bias | Not household-level; does not include digital finance | Interaction of income with digital credit adoption.                            |

|                       |   |  |   |  |  |
|-----------------------|---|--|---|--|--|
| Chwala (2024)         | Uganda, FinScope 2023 survey            | Mobile-money use strongly correlated with inclusion; influenced by education, gender, region | Recent Uganda-specific data                       | Focuses on inclusion broadly; not formal vs digital credit | Analyze formal, informal, and digital credit simultaneously          |
| BoU Reports (2024/25) | Uganda, national banking & e-money data | Digital loan disbursements and repayments surged   | Shows real-time trends                            | Lacks micro-level household analysis; no causal inference  | Micro-level UNHS 2019/20 analysis linking digital adoption to credit |
| Mayada et al. (1994)  | Cross-country (SSA)                     | Women face barriers due to lack of collateral and cultural norms                             | First evidence of gender gap in financial access  | Outdated, small-scale surveys                              | Analyze current gender inclusion under digital finance.              |
| Diagne et al. (2000)  | Mali, probit regression                 | Seasonal income variability reduces likelihood   | Shows effect of income fluctuation in agriculture | Not Uganda-specific; pre-digital finance era               | Examine how digital finance mitigates seasonal constraints.          |

|                            |  |   |   |   |   |
|----------------------------|--|---|---|---|---|
|                            |  | of credit access  |   |   |   |
| Zeller (1994)              | Madagascar, probit regression on household surveys | Education positively influences formal and informal credit access | Strong econometric approach; early micro-level evidence | Older study; not Uganda-specific; does not consider digital finance | Recent and Uganda-specific evidence needed. This study uses UNHS 2019/240 data. |
| Rosenzweig & Wolpin (1993) | India, household data                              | Household size affects credit demand                              | Early evidence on demographic factors                   | Context not SSA; pre-digital era                                    | Examine household size effect in Uganda   |

## CHAPTER THREE

### METHODOLOGY

#### 3.1 Theoretical model

The theoretical model is based in household utility maximization and credit market participation theory, as informed by the Human Capital Theory, Life-Cycle Hypothesis, Transaction Cost Theory, Social Capital Theory, and Utility Maximization

The Underlying assumption is that households decide whether or not to seek and obtain credit based on the expectation that borrowing will improve their utility, subject to constraints such as income, collateral, transaction costs, and information availability. This decision is binary; a household either accesses credit or does not.

Let

$$C_i^* = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_k X_{ki} + \varepsilon_i$$

Where,

$C_i^*$  is the unobserved (latent) propensity of household  $i$  to access credit.

$X_{ki}$  is the vector of explanatory variables like age, gender, education, income, asset ownership, distance to lender, group membership

$\beta_k$  are parameters to be estimated

$\varepsilon_i$  is the error term capturing unobserved factors.

The observed binary outcome is

$C_i = C_i^* > 0$  if the household accessed credit

$C_i = C_i^* < 0$  if the Household did not access credit

## 3.2 Model specification

### 3.2.1 Logit Regression model

Due to the binary nature of the dependent variable, a logistic regression model is preferred over a linear probability model (LPM).

Let

$Y_i$  be a binary variable such that,

$Y_i = 1$  if household  $i$  accessed credit and 0, if otherwise

$P(Y_i = 1|X_i)$  denote the conditional probability that household  $i$  accessed credit given the vector of explanatory variables  $X_i$

$$P(Y_i = 1|X_i) = \frac{e^{\beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_k X_{ki}}}{1 + e^{\beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_k X_{ki}}}$$

Taking the natural log of the odds ratio gives the logit model

$$\ln\left(\frac{P(Y = 1)}{1 - P(Y_i = 1)}\right) = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_k X_{ki} + \varepsilon_i$$

Where,

$P(Y = 1)$  is the probability of accessing of credit

$\beta_0$  is the intercept

$\beta_1, \beta_2 \dots \beta_k$  are the coefficients of the explanatory variables

$X_{1i}, X_{2i}, \dots, X_{ki}$  are the independent variables

$\varepsilon_i$  is the error term

$e$  is the base of natural logarithm

The full model specification is,

$$Y_i = \alpha + \beta_1 GEND_i + \beta_2 AGE_i + \beta_3 MAR_i + \beta_4 EDU_i + \beta_5 VSLA_i + \beta_6 INC_i + \beta_7 URBAN_i + \beta_8 REG_i + \varepsilon_i$$

Where,

$Y_i$  is the household access to credit (1-Yes, 0-No)

$\alpha$  is the intercept

$GEND_i$  - Gender of household head (1 if male, 0 otherwise),

$AGE_i$  - Age in years

$MAR_i$  marital status (1 = married, 0 = otherwise)

$EDU_i$  education (years or categorical dummies)

$VSLA_i$  membership (1 = VSLA/SACCO member)

$INC_i$  household monthly income (continuous or log)

$URBAN_i$  urban (1 = urban, 0 = rural)

$REG_i$  region Categorical- (Central, Eastern, Northern, Western)

### **Justification for the logistic regression model**

It ensures that predicted probabilities lie between 0 and 1, corrects for heteroskedasticity inherent in LPM, and it accounts for the non-linearity in the relationship between the independent variables and the probability of accessing credit

According to Gujarati & Porter (2009), the logit model is ideal when the outcome variable is dichotomous and the goal is to estimate the probability of an event occurring, in this case, access to credit.

### 3.2.2 Multinomial Logit Model

This model is appropriate because the dependent variable, credit access, is categorical with three possible outcomes, no credit, informal credit, and formal credit. Since these choices are mutually exclusive and unordered, the MNL framework provides a suitable approach for examining how household demographic, socio-economic, and institutional factors influence the likelihood of households falling into each of these credit categories.

Let  $Y_i$  be a categorical outcome for household  $i$  with three mutually exclusive outcomes,

$Y_i=0$  if household  $i$  did not access credit

$Y_i=1$  if household  $i$  accessed formal credit

$Y_i=2$  if household  $i$  accessed informal credit

Let  $X_i$  be the vector of explanatory variables.

The probability that household  $i$  chooses category  $j$  ( $j = 0,1,2$ ) is specified as,

$$P(Y_i=j|X_i) = \pi_{ij} = \frac{\exp(X_i'\beta_j)}{\sum_{m=0}^2 \exp(X_i'\beta_m)}, j = 0,1,2,$$

The explicit probabilities are,

$$\pi_{i0} = \frac{1}{1 + \exp(X_i'\beta_1) + \exp(X_i'\beta_2)}$$

$$\pi_{i1} = \frac{\exp(X_i'\beta_1)}{1 + \exp(X_i'\beta_1) + \exp(X_i'\beta_2)}$$

$$\pi_{i2} = \frac{\exp(X_i'\beta_2)}{1 + \exp(X_i'\beta_1) + \exp(X_i'\beta_2)}$$

The log odds are given by,

$$\ln\left(\frac{\pi_{i1}}{\pi_{i0}}\right) = (X_i'\beta_1)$$

$$\ln\left(\frac{\pi_{i2}}{\pi_{i0}}\right) = (X_i'\beta_2)$$

Where,

$i$  is the index for households

$j$  is the credit access category

$X_i$  is the column vector of explanatory variables

$\beta_j$  is the vector of coefficients associated with outcome  $j$

$\beta_1$  are the coefficients for informal credit vs no credit

$\beta_2$  are the coefficients for formal credit vs no credit

$\beta_0 = 0$  are the coefficients for the baseline (no credit)

$X_i'\beta_j$  is the linear predictor for household  $i$  in category  $j$

### **Justification for the Multinomial Logit Model**

The multinomial logit model simultaneously models the determinants of accessing no credit, informal credit, or formal credit, without imposing an artificial order on the categories. The MNL estimates the effect of explanatory variables on the log-odds of each outcome relative to a base category. This provides clear comparisons of what drives households into informal or formal credit markets relative to credit exclusion. The model allows different sets of household characteristics to influence each outcome differently, reflecting the reality that factors affecting informal borrowing may differ from those influencing formal credit access. The estimated coefficients can be easily interpreted through relative risk ratios (RRRs) or marginal effects, which provide policy-relevant insights into how changes in household characteristics alter the probability of accessing each type of credit.

### 3.3 Description of variables

**Table 3. 1:Dependent variable**

| Variable       | Description   | Measurement                             | Reference      |
|----------------|---|---|----------------|
| Credit access  | Whether the household accessed credit in the last 12 months | Binary: 1 - Yes, 0 - No                 | UNHS,2019/2020 |
| Credit Access2 |   | Three categories (Formal, informal, no) | UNHS 2019/2020 |

#### 3.3.1 Independent variables

The table below presents variables which are grounded in both theory and empirical evidence and are expected to significantly influence a household's access to credit. Understanding how these factors interact provides insights for policymakers and financial service providers to design more inclusive credit systems, particularly targeting underserved populations in Uganda.

**Table 3. 2:Independent variables**

| Variable | Description  | Coding procedure | Expected sign | Explanation  |
|----------|--------------|------------------|---------------|--|
| Age      | Age in years | Continuous       | Negative      | Younger individuals lack collateral/credit history (Stiglitz & Weiss, 1981), while middle-aged individuals have higher credibility. Very old |

|                  |  |                                 |          |   |
|------------------|--|---------------------------------|----------|---|
|                  |  |                                 |          | borrowers may be considered high risk (FSDU, 2018).   |
| Education Level  | Highest level of education completed (Years or categories) | Years of schooling              | Positive | Education enhances financial literacy and decision-making (Lusardi & Mitchell, 2007), improving confidence in engaging with formal lenders.                   |
| Marital status   | Married or not married                                     | 1-Married, 0-Not married        | Positive | Married individuals signal stability and responsibility (Coleman, 1988), often preferred by lenders.  |
| Gender           | Sex of the household                                       | 1-Male, 0-Female                | Positive | Men often access formal credit due to land/collateral ownership (UBOS, 2024), but women are more active in informal group lending (VSLA/SACCOs) (Udry, 1994). |
| Household income | Monthly household income                                   | Log-transformed due to skewness | Positive | Higher income increases creditworthiness and ability to repay loans. Stiglitz & Weiss (1981); UBOS (2024)   |
| Asset ownership  | Ownership of land/house                                    | 1-owns land/house, 0-Doesnot    | Positive | Ownership of assets acts as collateral and reduces lender risk. ( Credit  |

|                          |  |                  |          |   |
|--------------------------|--|------------------|----------|---|
|                          |  |                  |          | Rationing Theory Zeller, 1994)  |
| Urban Residence          | Urban or rural                                   | 1-Urban, 0-Rural | Positive | Urban areas have more financial infrastructure and services. (UBOS 2024, Beck & Hesse) (2009)                         |
| Region                   | Categorical- Central, Eastern, Northern, Western | Dummy variables  | Varies   | Regional disparities in financial inclusion affect access levels ( FSDU,2018; UNHS,2024)                              |
| Membership in VSLA/SACCO | Membership status                                | 1 -Yes, 0 -No    | Positive | Social capital and group lending reduce information asymmetry and collateral constraints. (Coleman, 1988 & Udry,1994) |

### 3.4 Data source

This study uses secondary data to analyze the determinants of credit access among households in Uganda. The data source is the Uganda National Household Survey UNHS ( 2019/2020), conducted by the Uganda Bureau of Statistics (UBOS). The UNHS is a nationally representative, cross-sectional survey designed to monitor the welfare and living conditions of Ugandan households. It provides detailed socio-economic and demographic data necessary to examine household access to credit and its determinants.

In using UBOS data, strict ethical considerations are observed. The dataset is provided in an anonymized format, ensuring that no household or individual can be directly identified. This safeguards confidentiality and protects respondents' privacy. The study complies with UBOS's

data access and use policy, which stipulates that the data may only be used for research and academic purposes, not for commercial or unauthorized dissemination.

Furthermore, UBOS is duly acknowledged as the official custodian and producer of the data, ensuring respect for intellectual property and research integrity. Since this study relies exclusively on secondary data, there is no direct interaction with human subjects, and thus no requirement for additional informed consent. However, the researcher maintains responsibility to ensure honest analysis, accurate reporting, and avoidance of misrepresentation that could negatively affect any population group.

### **3.5 Data handling**

The study uses the Uganda National Household Survey UNHS (2019/2020), collected by the Uganda Bureau of Statistics (UBOS). The survey employs a complex sampling design involving stratification, clustering, and weighting to ensure representativeness at the national, rural–urban, and regional levels. Proper handling of this dataset is crucial to generate unbiased and generalizable estimates.

#### **3.5.1 Data Cleaning**

The raw dataset contains multiple household- and individual-level modules. Variables such as education, income, and credit access were cross-checked across modules to ensure internal consistency for example, income reported in household consumption vs. employment section.

Outlier detection. Extreme values like unusually high household income or expenditure were identified using percentile checks and winsorization where appropriate, while retaining genuine cases of high-income households to avoid biasing the distribution.

Recoding variables, some categorical variables such as education, employment, and credit sources were harmonized into analytically meaningful categories for example, “formal credit” = bank/MFI/SACCO vs. “informal credit” = VSLA/moneylender/friends).

### **3.5.2 Handling missing data**

Missing data were assessed variable by variable. In UNHS, missingness is typically low due to UBOS quality controls, but sensitive questions like income or credit may have higher non-response. For key outcome variables, credit access households with missing responses were excluded from regression analysis. For continuous predictors like, income, missing values were handled using mean/median imputation within stratum where missingness was under 5%. For categorical predictors like, education, marital status, a “missing” category was created where non-response exceeded 5% to preserve sample size.

These methods balance the trade-off between minimizing bias and maximizing representativeness of the sample.

### **3.5.3 Sample Size Determination**

The initial UNHS 2019/20 dataset contains approximately 32,382 households. After merging relevant modules, excluding households with missing or inconsistent information on key variables like credit access, income, education, marital status, asset ownership, and VSLA/SACCO membership, removing logical inconsistencies, and applying survey design features, the final analytic sample comprised 13,645 households. This sample remains nationally representative due to the application of UBOS household weights, stratification, and clustering adjustments.

## **3.6 TRANSFORMATION OF KEY VARIABLES**

### **Transformation of Income Variable**

Income was not directly provided as a single variable. It was constructed by adding wage earnings, business income, crop and livestock income, transfers, rental income, and other minor sources. These components had different recall periods, they were converted to monthly values. Missing components were imputed using regional–residence medians, and negative values like business losses were set to zero. Households missing all components were excluded. Total monthly income was computed and then log-transformed as:

$$Income_i = Wage_i + Business_i + Crop_i + Livestock_i + Transfers_i + Rentals_i + Other_i$$

Because income is highly skewed, it was log-transformed:

$$\ln\_hincome = \ln (\text{Income}_i + 1)$$

The +1 ensures that households with zero income are retained.

The log transformation reduces skewness and ensures that extremely high income values do not distort model estimates (Wooldridge, 2010).

### **Household Size**

Household size was computed directly from the roster module.

$$HSIZE_i = \text{number of individuals living in the household at the time of the survey}$$

A log-transformed version was used in regression:

$$\ln (hsize)$$

Household size is right-skewed (a few households have 15–25 members), so logs stabilize variance

### **Age**

Age was extracted from the household roster and cleaned as follows:

Heads < 15 years old were considered invalid and excluded.

Ages > 110 were treated as unlikely and removed.

Age was log-transformed in the final model:

$$\ln (hage)$$

The effect of age on credit access is nonlinear middle-aged heads are more likely to borrow than very old or very young heads.

### **Education Level**

Education was recoded into four categories based on the highest completed level:

No formal education, Primary, Secondary, Post-secondary

Dummy variables were created, primary = 1 if primary, else 0, secondary = 1 if secondary, else 0, post sec = 1 post-secondary, else 0, Reference category = no formal education

Categorical dummies allow the model to estimate the incremental effect of higher education levels.

### **Asset ownership**

Derived from the household assets module.

A household was coded as:

$$Asset_i = \begin{cases} 1 & \text{if household owns land, livestock, or a dwelling} \\ 0 & \text{otherwise} \end{cases}$$

If a household owned any of these, it qualifies as “having collateral.”

### **Marital status**

Coded from roster information:

$$MAR_i = \begin{cases} 1 & \text{if household head is married or cohabiting} \\ 0 & \text{if single, widowed, divorced, separated} \end{cases}$$

Gender of Household Head (GEND)

From roster module:

$$GEND_i = \begin{cases} 1 & \text{Male} \\ 0 & \text{Female} \end{cases}$$

VSLA/SACCO Membership (VSLA)

Extracted from the financial services module.

$$VSLA_i = \begin{cases} 1 & \text{if household head is a member of a VSLA or SACCO} \\ 0 & \text{otherwise} \end{cases}$$

This captures the effect of social capital.

### **Urban-Rural Residence**

From EA identifiers:

$$URBAN_i = \begin{cases} 1 & \text{Urban EA} \\ 0 & \text{Rural EA} \end{cases}$$

### **Region**

Categorical dummies, Eastern = 1, Northern = 1, Western = 1, Central = reference category

Ensures correct baseline comparison.

Overview summary

All key variables were constructed using standard UBOS definitions and cleaned following international best-practice procedures. Household income was created by aggregating all income sources and standardizing recall periods. Income and household size were log-transformed to correct skewness. Education, marital status, gender, residence, region, VSLA/SACCO membership, and asset ownership were recoded into analytically meaningful categories. Missing, inconsistent, or implausible values were addressed through imputation or exclusion to ensure reliability of model estimates. These procedures guarantee transparency, replicability, and alignment with econometric modelling requirements.

### 3.7 Justification for Variable Exclusion and Adjustments.

Several variables were excluded or adjusted based on issues of missingness, measurement error, multicollinearity, conceptual redundancy, or lack of theoretical relevance. Variables with excessive missing data or inconsistent records were dropped to preserve data quality. Wealth-related indicators that exhibited multicollinearity with income and asset ownership were excluded to avoid inflated standard errors. Variables potentially endogenous to credit access such as business income, crop sales, or consumption were removed to prevent biased estimates. Only variables grounded in credit rationing theory, human capital theory, social capital theory, and established empirical literature were retained. These exclusions and adjustments ensured a parsimonious, theoretically consistent, and statistically robust model.

### 3.8 Survey Weights

UNHS dataset provides household weights that correct for unequal probability of selection and non-response. Survey weights can be weighted or un weighted. Weighted analysis uses the household sampling weights provided by UBOS to ensure population-representative estimates. Weighted regressions provide unbiased, nationally representative, and methodologically correct estimates for Uganda. Unweighted analysis treats every sampled household equally, regardless of how many households it represents in the population. Unweighted regressions provide biased point estimates and incorrect variance estimates, leading to misleading policy conclusions. All descriptive statistics (means, percentages, cross-tabulations) and regression analyses were computed using the weighted results to ensure that estimates reflect the Ugandan population, not just the sample. Without applying weights, results would disproportionately represent oversampled areas, especially rural households.

The survey weight logit model is,

$$\ln\left(\frac{P_i}{1 - P_i}\right) = w_i(\beta_0 + \beta_1 X_{1i} + \dots + \beta_k X_{ki})$$

Where  $w_i$  is the UBOS sample weight.

### **3.9 Survey Design Features (Strata and Clusters)**

The UNHS 2019/2020 survey employed a two-stage stratified sampling design. First, the sample was stratified by region (Central, Eastern, Northern, Western) and by rural–urban residence to ensure adequate representation of all major geographic and socioeconomic groups, thereby improving the precision of national and sub-national estimates.

In the second stage, Enumeration Areas (EAs) were selected as Primary Sampling Units (PSUs), followed by the selection of households within each EA. Because households within the same EA tend to be more alike than those in different EAs, the design introduces intra-cluster correlation. Ignoring this correlation would underestimate standard errors and inflate statistical significance. Therefore, all analyses incorporate both stratification and clustering to produce valid variance estimates.

### **3.10 Robustness strategy**

#### **3.10.1 Alternative model specifications**

The main analysis employs a binary logistic regression model to examine the determinants of household credit access. To validate the robustness of results, alternative specifications are considered:

#### **Multinomial Logit Model**

This distinguishes between formal credit access, informal credit access, and no access, allowing for a richer understanding of heterogeneous effects Cameron & Trivedi, (2005).

### **3.11 Multicollinearity Checks**

Multicollinearity refers to excessive correlation among explanatory variables, which can inflate coefficient standard errors and distort statistical inference Gujarati & Porter, (2009). To test for multicollinearity, Variance Inflation Factors (VIFs) were computed for all independent variables.

VIF Thresholds are, VIF < 5: No multicollinearity concern, VIF 5–10: Moderate concern, VIF > 10: Serious multicollinearity (requires correction)

### **3.12 Model validation**

#### **3.12.1 Hosmer–Lemeshow Goodness-of-Fit Test**

The Hosmer–Lemeshow test evaluates how well predicted probabilities match actual outcomes Hosmer, Lemeshow & Sturdivant, (2013).

H<sub>0</sub>: Model fits the data well,

H<sub>1</sub>: Model does not fit the data

#### **3.12.2 Likelihood Ratio (LR) Test**

The LR test compares the fitted model to a null model with no predictors.

H<sub>0</sub>: All  $\beta$  coefficients = 0 (model has no explanatory power),

H<sub>1</sub>: At least one  $\beta \neq 0$

#### **3.12.3 Pseudo R-squared Values**

Because logistic models do not use OLS R<sup>2</sup>, pseudo R<sup>2</sup> measures were computed:

These values are typical for household decision models using survey data Long & Freese, (2014).

#### **3.12.4 ROC Curve and Predictive Accuracy**

A Receiver Operating Characteristic (ROC) curve was generated to evaluate the model's ability to correctly classify households into credit access vs. no access.

### **3.13 Sensitivity Analysis**

Sensitivity checks ensure that results are robust to alternative assumptions and data treatments:

Models are re-estimated after excluding outliers and influential observations identified using leverage and Cook's distance (Belsley, Kuh & Welsch, 1980).

Sub-sample analyses by region Central, Eastern, Northern, Western and residence type urban vs. rural test whether determinants vary across subpopulations.

Alternative coding of key variables like income quartiles instead of continuous income, or categorical education levels is applied to confirm the stability of coefficients

## CHAPTER FOUR

### DATA ANALYSIS RESULTS AND DISCUSSION

#### 4.1 Univariate Analysis

**Table 4. 1: Tabulation of Credit Access**

| <b>Has household accessed Credit in the past 12 months</b> | <b>Freq.</b> | <b>Percent</b> | <b>Cum.</b> |
|--|--------------|----------------|-------------|
| No   | 6828509      | 77.20          | 77.20       |
| Yes  | 2016156      | 22.80          | 100.00      |
| Total  | 8844665      | 100.00         |             |

*Source: UNHS 2019/2020*

The results show that 22.8% of households accessed credit in the past 12 months, while 77.2% did not. This implies that the majority of Ugandan households remain excluded from credit markets. The low access levels align with findings by UBOS (2024) and Bank of Uganda (2023), which attribute limited access to high collateral requirements, low financial literacy, and limited financial outreach, especially in rural areas UBOS, (2024); Bank of Uganda, (2023).

**Table 4. 2: Tabulation of Credit Access 2**

| <b>Source of Credit</b> | <b>Freq.</b> | <b>Percent</b> | <b>Cum.</b> |
|-------------------------|--------------|----------------|-------------|
| None                    | 7207192      | 81.49          | 81.49       |
| Formal                  | 425095.6     | 4.81           | 86.29       |
| Informal                | 1212377      | 13.71          | 100.00      |
| Total                   | 8844665      | 100.00         |             |

*Source: UNHS 2019/2020*

About 81.5% of households had no credit, 4.8% obtained credit from formal sources, and 13.7% from informal sources. Informal lenders dominate due to flexible lending terms and accessibility Finscope Uganda, (2023). This pattern is common in developing economies where formal credit systems are less inclusive Beck et al., (2019).

**Table 4. 3: Tabulation of Education level**

| <b>Highest level of Education</b> | <b>Freq.</b> | <b>Percent</b> | <b>Cum.</b> |
|-----------------------------------|--------------|----------------|-------------|
| No Formal Education               | 1542264      | 17.44          | 17.44       |
| Primary                           | 4369921      | 49.41          | 66.84       |
| Secondary                         | 2083529      | 23.56          | 90.40       |
| Post Secondary                    | 848949.7     | 9.60           | 100.00      |
| Total                             | 8844665      | 100.00         |             |

*Source: UNHS 2019/2020*

The results indicate that 49.4% of household heads had primary education, 23.6% secondary, 9.6% post-secondary, and 17.4% had no formal education. Education improves literacy, understanding of financial products, and confidence to engage with formal financial institutions Munyegera & Matsumoto, (2016).

**Table 4. 4: Tabulation of Marital Status**

| <b>Marital Status</b> | <b>Freq.</b> | <b>Percent</b> | <b>Cum.</b> |
|-----------------------|--------------|----------------|-------------|
| Not Married           | 2807141      | 31.74          | 31.74       |
| Married               | 6037524      | 68.26          | 100.00      |
| Total                 | 8844665      | 100.00         |             |

*Source: UNHS 2019/2020*

The results show that 68.3% of household heads were married, while 31.7% were not. Marital stability often enhances household savings and investment behavior, improving eligibility for credit Okurut et al., (2019).

**Table 4. 5: Tabulation of Sex of the household head**

| <b>Sex of the household head</b> | <b>Freq.</b> | <b>Percent</b> | <b>Cum.</b> |
|----------------------------------|--------------|----------------|-------------|
| Female                           | 2823716      | 31.93          | 31.93       |
| Male                             | 6020949      | 68.07          | 100.00      |
| Total                            | 8844665      | 100.00         |             |

Source: UNHS 2019/2020

The data shows that 68.1% of household heads were male and 31.9% female. This reflects the persistent gender gap in financial inclusion, where women face social and economic barriers to accessing credit Demirgüç-Kunt et al., (2022).

**Table 4. 6: Tabulation of asset ownership**

| <b>Does the household own Assets</b> | <b>Freq.</b> | <b>Percent</b> | <b>Cum.</b> |
|--------------------------------------|--------------|----------------|-------------|
| No                                   | 7214089      | 81.56          | 81.56       |
| Yes                                  | 1630575      | 18.44          | 100.00      |
| Total                                | 8844665      | 100.00         |             |

Source: UNHS 2019/2020

18.4% of households owned assets while 81.56% did not own assets Asset ownership is key in credit markets because it serves as collateral Kisaka & Mweha, (2014). Low asset possession limits access to formal loans.

**Table 4. 7: Tabulation of Stability of source of income**

| <b>Stability of main source of income in the past 12 months</b> | <b>Freq.</b> | <b>Percent</b> | <b>Cum.</b> |
|---|--------------|----------------|-------------|
| Unstable  | 4683518      | 52.95          | 52.95       |
| Somewhat Stable   | 3716874      | 42.02          | 94.98       |
| Stable  | 444272.9     | 5.02           | 100.00      |
| Total   | 8844665      | 100.00         |             |

Source: UNHS 2019/2020

The majority households 52.9% had unstable incomes, 42.0% somewhat stable, and 5.0% stable. Income volatility undermines the ability to meet regular loan repayments and discourages lenders from extending credit World Bank, (2020).

**Table 4. 8: Tabulation of Place of residence**

| <b>Residence</b> | <b>Freq.</b> | <b>Percent</b> | <b>Cum.</b> |
|------------------|--------------|----------------|-------------|
| Rural            | 6205478      | 70.16          | 70.16       |
| Urban            | 2639186      | 29.84          | 100.00      |
| Total            | 8844665      | 100.00         |             |

*Source: UNHS 2019/2020*

The results show 70.2% of the sample lived in rural areas and 29.8% in urban areas. Rural dominance in Uganda’s population explains low access to formal credit, as most financial institutions are urban-based UBOS, 2024; BoU,( 2023).

**Table 4. 9: Tabulation of region**

| <b>Region</b> | <b>Freq.</b> | <b>Percent</b> | <b>Cum.</b> |
|---------------|--------------|----------------|-------------|
| Central       | 2788997      | 31.53          | 31.53       |
| Eastern       | 2043182      | 23.10          | 54.63       |
| Northern      | 1848024      | 20.89          | 75.53       |
| Western       | 2164461      | 24.47          | 100.00      |
| Total         | 8844665      | 100.00         |             |

*Source: UNHS 2019/2020*

The Central region had 31.5% of households, Eastern 23.1%, Northern 20.9%, and Western 24.5%. Economic and infrastructural disparities among regions influence credit access, with the Central region benefiting from greater institutional presence MFPED, (2023)

**Table 4. 10: Tabulation of VSLA\_SACCO**

| <b>Membership to VSLA or SACCO</b> | <b>Freq.</b> | <b>Percent</b> | <b>Cum.</b> |
|------------------------------------|--------------|----------------|-------------|
| Not member                         | 6048878      | 68.39          | 68.39       |
| Is member                          | 2795787      | 31.61          | 100.00      |
| Total                              | 8844665      | 100.00         |             |

*Source: UNHS 2019/2020*

About 31.6% of households belonged to a VSLA or SACCO, while 68.4% were non-members. Group membership enhances access to savings and borrowing opportunities through trust and social networks Munyegera & Matsumoto, (2016); Allen & Panetta, 2010).

**Table 4. 11: Descriptive Statistics of continuous variables**

| Variable           | Obs   | Mean      | Std. Dev. | Min | Max       |
|--------------------|-------|-----------|-----------|-----|-----------|
| Household age      | 13645 | 44.994    | 16.18     | 15  | 108       |
| Household size     | 13645 | 4.712     | 2.547     | 1   | 25        |
| Household income T | 13645 | 531953.33 | 3189036.6 | 0   | 2.706e+08 |

Source: UNHS 2019/2020

The average household head was 45 years old, with an average household size of about five members and average income of UGX 532,000. The wide income variation indicates inequality, consistent with national income distribution statistics UBOS, (2024).

## 4.2 SUBGROUP ANALYSIS

### Variations of credit access

**Table 4. 12: Credit Access by residence**

| Residence                          | Credit Access |      |       |
|------------------------------------|---------------|------|-------|
|                                    | No            | Yes  | Total |
| Rural                              | 7700          | 2380 | 10080 |
| Urban                              | 2857          | 708  | 3565  |
| Total                              | 10557         | 3088 | 13645 |
| Pearson Chi2 = 21.17 Prob = 0.0000 |               |      |       |

Source: UNHS 2019/2020

Households living in urban areas show a higher proportion of credit access (708 out of 3,565; 19.8%) compared to rural households (2,380 out of 10,080; 23.6%). The Pearson chi-square test ( $\chi^2 = 21.17$ ,  $p < 0.001$ ) indicates that this difference is statistically significant, meaning credit access varies meaningfully between rural and urban households.

**Table 4. 13: Credit Access by sex of the head of household**

| Sex of the household age          | Credit Access |      |       |
|-----------------------------------|---------------|------|-------|
|                                   | No            | Yes  | Total |
| Female                            | 3512          | 975  | 4487  |
| Male                              | 7045          | 2113 | 9158  |
| Total                             | 10557         | 3088 | 13645 |
| Pearson Chi2 = 3.10 Prob = 0.0781 |               |      |       |

Source: UNHS 2019/2020

Male headed households show a slightly higher proportion of credit access (2,113 out of 9,158; 23.1%) than female headed households (975 out of 4,487; 21.7%). However, the difference is not statistically significant ( $\chi^2 = 3.10$ ,  $p = 0.0781$ ). This suggests that sex of the household head is not a major determinant of credit access in this population.

**Table 4. 14: Credit Access by Education level**

| Education level                     | Credit Access |      |       |
|-------------------------------------|---------------|------|-------|
|                                     | No            | Yes  | Total |
| No Formal Education                 | 2260          | 374  | 2634  |
| Primary                             | 5166          | 1633 | 6799  |
| Secondary                           | 2285          | 781  | 3066  |
| Post Secondary                      | 846           | 300  | 1146  |
| Total                               | 10557         | 3088 | 13645 |
| Pearson Chi2 = 136.81 Prob = 0.0000 |               |      |       |

Source: UNHS 2019/2020

Credit access increases with education. Households with post-secondary education have the highest share (300 out of 1,146; 26.2%), followed by those with secondary (25.5%) and primary

education (24.0%). Those with no formal education have the lowest access (14.2%). The chi-square statistic ( $\chi^2 = 136.81$ ,  $p < 0.001$ ) confirms that education is strongly associated with credit access, with higher education levels linked to greater access.

**Table 4. 15: Credit Access by marital status**

| Marital Status                    | Credit Access |      |       |
|-----------------------------------|---------------|------|-------|
|                                   | No            | Yes  | Total |
| Not Married                       | 3217          | 884  | 4101  |
| Married                           | 7340          | 2204 | 9544  |
| Total                             | 10557         | 3088 | 13645 |
| Pearson Chi2 = 3.87 Prob = 0.0491 |               |      |       |

Source: UNHS 2019/2020

Married households have a slightly higher probability of accessing credit (2,204 out of 9,544; 23.1%) compared to non-married households (884 out of 4,101; 21.6%). The association is statistically significant ( $\chi^2 = 3.87$ ,  $p = 0.0491$ ), though the difference is relatively small. This suggests that marital status has a meaningful relationship with credit access.

**Table 4. 16: Credit Access by Stability**

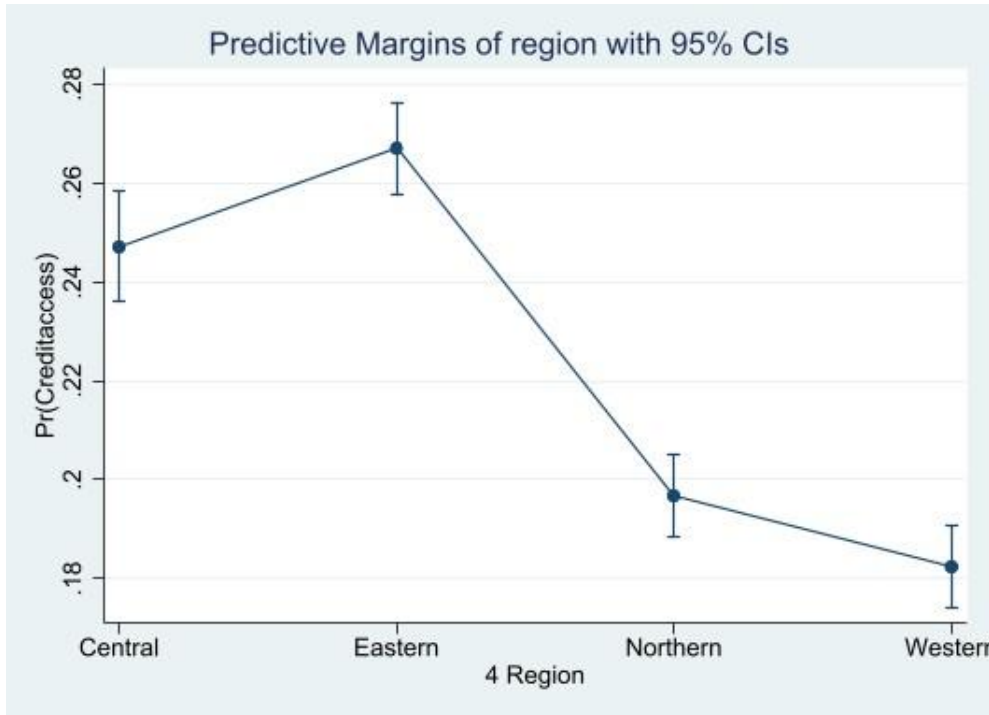
| Stability                          | Credit Access |      |       |
|------------------------------------|---------------|------|-------|
|                                    | No            | Yes  | Total |
| Unstable                           | 5904          | 1593 | 7497  |
| Somewhat Stable                    | 4138          | 1336 | 5474  |
| Stable                             | 515           | 159  | 674   |
| Total                              | 10557         | 3088 | 13645 |
| Pearson Chi2 = 18.39 Prob = 0.0001 |               |      |       |

Source: UNHS 2019/2020

Household stability is strongly associated with credit access. Credit access is lowest in unstable households (21.3%) and highest in stable households (23.6%). The chi-square test ( $\chi^2 = 18.39$ ,  $p < 0.001$ ) shows a significant relationship, indicating that more stable households are more likely to access credit.

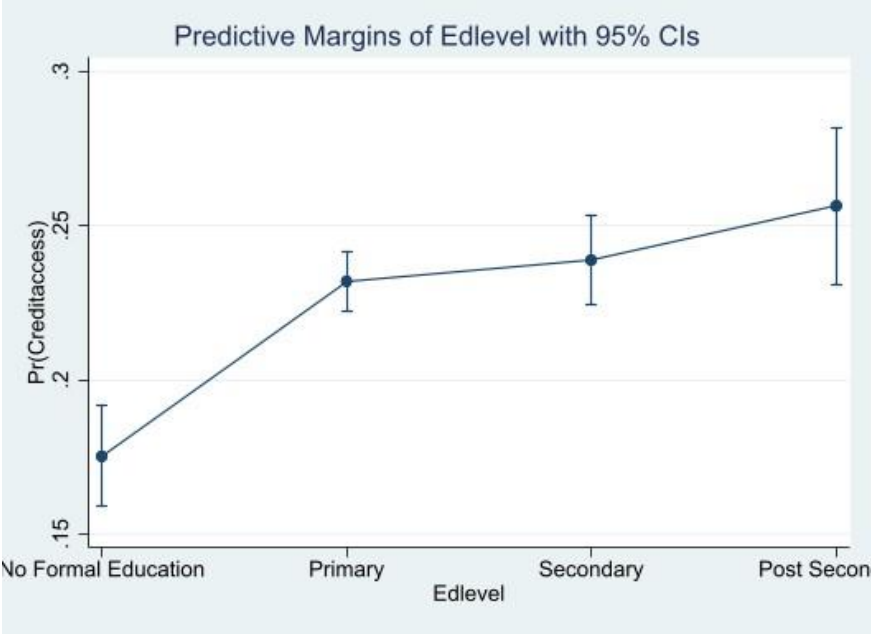
### 4.3 PREDICTED PROBABILITY GRAPHS

Figure 4. 1: Region



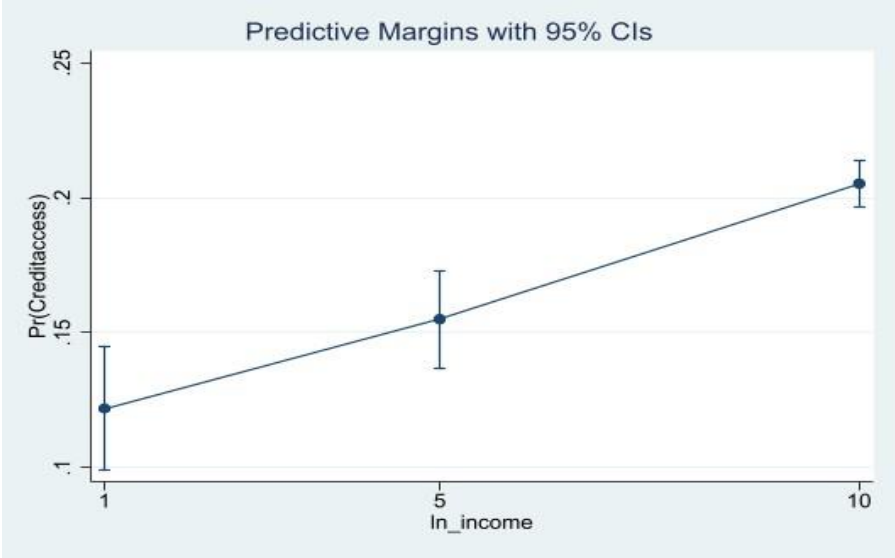
Predicted access to credit varies notably by region. Individuals in the Eastern region have the highest likelihood (27%) of accessing credit, whereas those in the Western region have the lowest (20%). A clear regional gradient emerges (Eastern > Central > Northern > Western), indicating that region is a significant predictor of credit access, with marked disparities between Eastern and Western areas.

**Figure 4. 2: Education level :**



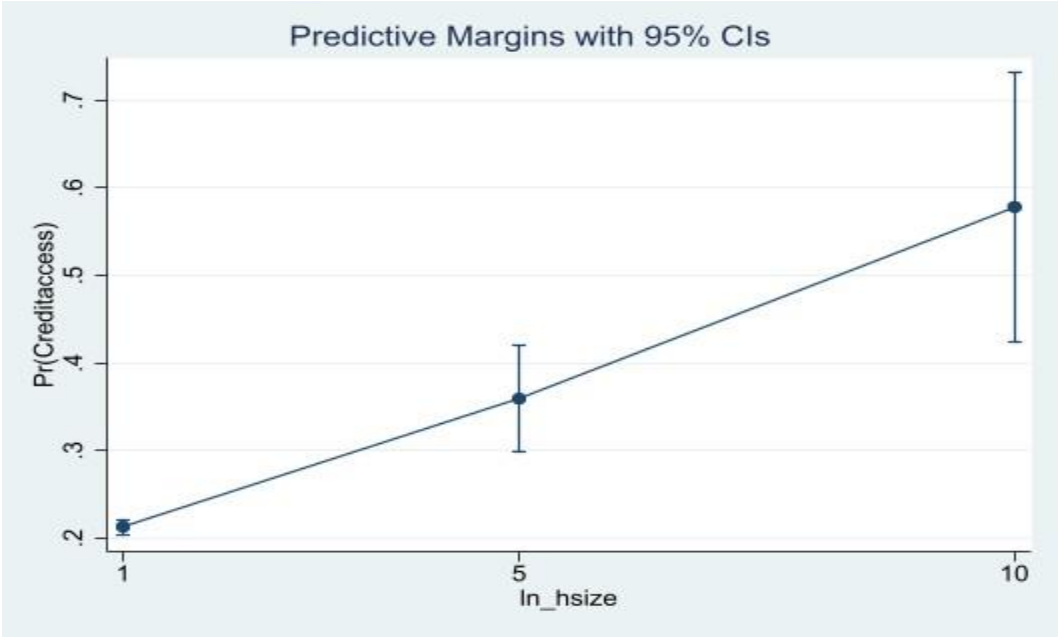
The predicted probability of accessing credit increases with education level. Individuals with no formal education have the lowest predicted access (17%), while those with post-secondary education have the highest (26%). The gradient suggests that education is a strong predictor of credit access, with higher education consistently associated with greater likelihood of accessing credit.

**Figure 4. 3: House hold Income**



The graph shows the predicted probability of having credit access ( $\text{Pr}(\text{Creditaccess})$ ) across different income levels ( $\ln\_income$ ), with 95% confidence intervals. As income increases from 1 to 10, the predicted probability of credit access rises from about 0.12 to 0.21, indicating a positive relationship between income and credit access. The error bars suggest some uncertainty, but there is no overlap between the lowest and highest income points, implying that higher income is associated with a significantly higher likelihood of having credit access.

**Figure 4. 4: size of the household:**



The plot shows the predicted probability of Credit access as a function of  $\ln\_hsize$  (log of household size), with 95% confidence intervals. As  $\ln\_hsize$  increases from 1 to 10, the predicted probability of having credit access rises from about 0.2 to around 0.58, indicating a positive relationship. Overall, larger households are more likely to have credit access, but estimates are less precise at the higher end.

### 4.3 BIVARIATE ANALYSIS

#### 4.3.1 BINARY LOGIT MODEL

**Table 4. 17: Cross-Tabulation between Education level and Credit access**

| Education level     | Credit Access |          |          |
|---------------------|---------------|----------|----------|
|                     | No            | Yes      | Total    |
| No Formal Education | 1301482       | 240782.7 | 1542264  |
|                     | 19.06         | 11.94    | 17.44    |
| Primary             | 3339963       | 1029958  | 4369921  |
|                     | 48.91         | 51.09    | 49.41    |
| Secondary           | 1559938       | 523591.5 | 2083529  |
|                     | 22.84         | 25.97    | 23.56    |
| Post Secondary      | 627126.4      | 221823.2 | 848949.7 |
|                     | 9.18          | 11.00    | 9.60     |
| Total               | 6828509       | 2016156  | 8844665  |
|                     | 100.00        | 100.00   | 100.00   |

*Source: UNHS 2019/2020*

First row has *frequencies* and second row has *column percentages*

The results indicate that households with higher education levels are more likely to access credit. While 19.06% of households without formal education did not access credit, only 11.94% of those who accessed credit fall under this group. Conversely, households with secondary and post-secondary education make up a larger share of those accessing credit 25.97% and 11.00%, respectively than those without. Education improves financial literacy, awareness of financial institutions, and ability to complete credit application processes, thus enhancing access to credit (Okurut, 2006; Beck & Demirgüç-Kunt, 2008). Therefore, education positively correlates with credit access.

**Table 4. 18: Cross-Tabulation between Marital Status and Credit Access**

| Marital Status | Credit Access |          |         |
|----------------|---------------|----------|---------|
|                | No            | Yes      | Total   |
| Not Married    | 2186551       | 620589.7 | 2807141 |
|                | 32.02         | 30.78    | 31.74   |
| Married        | 4641958       | 1395566  | 6037524 |
|                | 67.98         | 69.22    | 68.26   |
| Total          | 6828509       | 2016156  | 8844665 |
|                | 100.00        | 100.00   | 100.00  |

Source: UNHS 2019/2020

First row has *frequencies* and second row has *column percentages*

Married household heads are more likely to access credit than unmarried ones. About 69.22% of those who accessed credit were married compared to 67.98% among those who did not. Marital status may reflect household stability, shared responsibilities, and potential collateral through joint assets, which financial institutions favor when issuing loans (Diagne & Zeller, 2001). Married individuals may also have larger financial needs, motivating them to seek credit.

**Table 4. 19: Cross-Tabulation between Sex of the household head and Credit Access**

| Sex of the household head | Credit Access |          |         |
|---------------------------|---------------|----------|---------|
|                           | No            | Yes      | Total   |
| Female                    | 2187538       | 636177.8 | 2823716 |
|                           | 32.04         | 31.55    | 31.93   |
| Male                      | 4640971       | 1379978  | 6020949 |
|                           | 67.96         | 68.45    | 68.07   |
| Total                     | 6828509       | 2016156  | 8844665 |
|                           | 100.00        | 100.00   | 100.00  |

Source: UNHS 2019/2020

First row has *frequencies* and second row has *column percentages*

There is gender disparity in credit access. Male-headed households constitute a slightly higher proportion of those accessing credit 68.45% compared to female-headed households 31.55%. Despite efforts to promote gender equality in financial inclusion, male-headed households may still have better access due to ownership of collateral, social networks, and income stability (Kassie et al., 2011). However, the gap is narrowing as microfinance and SACCOs increasingly target women.

**Table 4. 20: Cross-Tabulation between asset ownership and Credit Access**

| <b>Owens<br/>Assets</b> | <b>Credit Access</b> |                |                |
|-------------------------|----------------------|----------------|----------------|
|                         | <b>No</b>            | <b>Yes</b>     | <b>Total</b>   |
| No                      | 5603834              | 1610255        | 7214089        |
|                         | 82.07                | 79.87          | 81.56          |
| Yes                     | 1224675              | 405900.5       | 1630575        |
|                         | 17.93                | 20.13          | 18.44          |
| <b>Total</b>            | <b>6828509</b>       | <b>2016156</b> | <b>8844665</b> |
|                         | 100.00               | 100.00         | 100.00         |

*Source: UNHS 2019/2020*

First row has *frequencies* and second row has *column percentages*

Households that own assets are more likely to access credit 20.13% compared to those that do not 79.87%. Asset ownership serves as collateral and a measure of financial security, making it easier for households to qualify for credit Baiyegunhi et al.,(2010). Households without assets face higher credit constraints due to perceived risk by lenders.

**Table 4. 21: Cross-Tabulation between Stability of source of income and Credit Access**

| Income Stability | Credit Access |          |          |
|------------------|---------------|----------|----------|
|                  | No            | Yes      | Total    |
| Unstable         | 3641824       | 1041694  | 4683518  |
|                  | 53.33         | 51.67    | 52.95    |
| Somewhat Stable  | 2841571       | 875302.6 | 3716874  |
|                  | 41.61         | 43.41    | 42.02    |
| Stable           | 345114        | 99158.96 | 444272.9 |
|                  | 5.05          | 4.92     | 5.02     |
| Total            | 6828509       | 2016156  | 8844665  |
|                  | 100.00        | 100.00   | 100.00   |

Source: UNHS 2019/2020

First row has *frequencies* and second row has *column percentages*

Households with somewhat stable incomes are slightly more likely to access credit (43.41%) than those with unstable incomes (51.67%). Income stability increases a household's capacity to repay loans, improving their creditworthiness. Lenders often assess income patterns to determine repayment ability (Karlan & Morduch, (2010)). Thus, households with more predictable incomes are more likely to secure credit.

**Table 4. 22: Cross-Tabulation between place of residence and Credit Access**

| Residence | Credit Access |          |         |
|-----------|---------------|----------|---------|
|           | No            | Yes      | Total   |
| Rural     | 4729422       | 1476056  | 6205478 |
|           | 69.26         | 73.21    | 70.16   |
| Urban     | 2099086       | 540099.7 | 2639186 |
|           | 30.74         | 26.79    | 29.84   |
| Total     | 6828509       | 2016156  | 8844665 |
|           | 100.00        | 100.00   | 100.00  |

Source: UNHS 2019/2020

First row has *frequencies* and second row has *column percentages*

Credit access is higher in rural areas 73.21% than urban areas 26.79%. This could be attributed to the widespread presence of SACCOs and Village Savings and Loan Associations (VSLAs) in rural Uganda, which promote local lending and borrowing UBOS, (2024). In contrast, urban dwellers may rely more on formal banking institutions that have more strict lending requirements.

**Table 4. 23: Cross-Tabulation between region and Credit Access**

| Region   | Credit Access |          |         |
|----------|---------------|----------|---------|
|          | No            | Yes      | Total   |
| Central  | 2193465       | 595532.4 | 2788997 |
|          | 32.12         | 29.54    | 31.53   |
| Eastern  | 1474034       | 569148.1 | 2043182 |
|          | 21.59         | 28.23    | 23.10   |
| Northern | 1457196       | 390827.6 | 1848024 |
|          | 21.34         | 19.38    | 20.89   |
| Western  | 1703814       | 460647.6 | 2164461 |
|          | 24.95         | 22.85    | 24.47   |
| Total    | 6828509       | 2016156  | 8844665 |
|          | 100.00        | 100.00   | 100.00  |

Source: UNHS 2019/2020

First row has *frequencies* and second row has *column percentages*

Eastern region shows a relatively higher proportion of households accessing credit (28.23%) compared to its share of non-access (21.59%). The Northern region has the lowest access levels. Regional variations may be due to differences in financial infrastructure, economic activity, and presence of microfinance institutions. The Central and Eastern regions, with stronger economic bases, tend to have better credit access World Bank, (2020).

**Table 4. 24: Cross-Tabulation between VSLA\_SACCO membership and Credit Access**

| Membershi<br>p to VSLA<br>or SACCO | Credit Access |         |         |
|------------------------------------|---------------|---------|---------|
|                                    | No            | Yes     | Total   |
| Not<br>member                      | 5036022       | 1012856 | 6048878 |
|                                    | 73.75         | 50.24   | 68.39   |
| Is member                          | 1792487       | 1003300 | 2795787 |
|                                    | 26.25         | 49.76   | 31.61   |
| Total                              | 6828509       | 2016156 | 8844665 |
|                                    | 100.00        | 100.00  | 100.00  |

Source: UNHS 2019/2020

First row has *frequencies* and second row has *column percentages*

Membership in a VSLA or SACCO significantly enhances credit access. Almost half 49.76% of those who accessed credit belong to such associations. VSLAs and SACCOs provide members with easier, low-collateral credit opportunities and financial training. Membership also builds trust and collective saving behavior, improving members' creditworthiness Allen & Panetta, (2010).

#### 4.2.2 Binary Logistic regression results

This table presents the odds ratios (exponentiated coefficients) from a binary logistic regression where the dependent variable is Credit Access (1 = access to credit, 0 = otherwise). The model estimates the likelihood of a household accessing credit based on socioeconomic, demographic, and regional factors.

**Table 4. 25: Binary Logistic regression results**

|                    |                           | Delta-method |        |       |           |           |
|--------------------|---------------------------|--------------|--------|-------|-----------|-----------|
|                    | Marginal Effects<br>dy/dx | Std.Err.     | z      | P>z   | [95%Conf. | Interval] |
| ln_hhage           | -0.088                    | 0.012        | -7.050 | 0.000 | -0.112    | -0.063    |
| Edlevel            |                           |              |        |       |           |           |
| Primary            | 0.046                     | 0.012        | 3.900  | 0.000 | 0.023     | 0.069     |
| Secondary          | 0.055                     | 0.014        | 3.860  | 0.000 | 0.027     | 0.083     |
| Post<br>Secondary  | 0.082                     | 0.021        | 3.930  | 0.000 | 0.041     | 0.122     |
| MaritalStatus      |                           |              |        |       |           |           |
| Married            | -0.064                    | 0.014        | -4.700 | 0.000 | -0.091    | -0.037    |
| hhsex              |                           |              |        |       |           |           |
| Male               | -0.011                    | 0.012        | -0.920 | 0.358 | -0.033    | 0.012     |
| ln_hincome         | 0.014                     | 0.002        | 5.830  | 0.000 | 0.009     | 0.018     |
| OwnsAssets         |                           |              |        |       |           |           |
| Yes                | 0.007                     | 0.011        | 0.670  | 0.504 | -0.014    | 0.028     |
| Stability          |                           |              |        |       |           |           |
| Somewhat<br>Stable | -0.009                    | 0.009        | -0.940 | 0.349 | -0.026    | 0.009     |
| Stable             | -0.045                    | 0.019        | -2.320 | 0.020 | -0.083    | -0.007    |
| ln_hsize           | 0.033                     | 0.008        | 4.060  | 0.000 | 0.017     | 0.049     |

|            |        |       |        |       |        |        |
|------------|--------|-------|--------|-------|--------|--------|
| urban      |        |       |        |       |        |        |
| Urban      | -0.037 | 0.010 | -3.610 | 0.000 | -0.057 | -0.017 |
| region     |        |       |        |       |        |        |
| Eastern    | 0.040  | 0.012 | 3.280  | 0.001 | 0.016  | 0.064  |
| Northern   | -0.026 | 0.013 | -2.070 | 0.038 | -0.051 | -0.001 |
| Western    | -0.013 | 0.012 | -1.030 | 0.301 | -0.037 | 0.011  |
| VSLA_SACCO |        |       |        |       |        |        |
| Is member  | 0.175  | 0.010 | 17.510 | 0.000 | 0.155  | 0.194  |

Note: dy/dx for factor levels is the discrete change from the base level.

Source: UNHS 2019/2020

Household Age (ln\_hhage),  $dy/dx = -0.088$ ,  $p < 0.001$ : An increase in household head age reduces the probability of accessing formal credit by 8.8 percentage points. Younger household heads are more likely to access formal credit, possibly due to greater engagement with digital credit or microfinance programs targeting youth. This aligns with the life-cycle theory Modigliani & Brumberg, (1954) and the credit rationing framework Stiglitz & Weiss, (1981), where older borrowers may be perceived as higher risk or less profitable by formal lenders. Similar findings were reported by Kisaka & Oburu (2019) in East Africa.

Education Level (Edlevel). Primary (0.046), Secondary (0.055), Post-secondary (0.082), all  $p < 0.001$ . Education increases the probability of credit access. Post-secondary education increases access by 8.2 percentage points. Education improves financial literacy, reduces information asymmetry, and enhances lender confidence, information asymmetry theory, Stiglitz & Weiss, (1981). Karlan & Morduch (2010) and FSDU (2018) show higher education levels increase formal credit uptake.

Marital Status. Married ( $dy/dx = -0.064$ ,  $p < 0.001$ ). Being married reduces the probability of having no credit access or informal-only credit by 6.4 percentage points. Married households are perceived as more stable and reliable by lenders (credit rationing theory, Stiglitz & Weiss, (1981). Mpiira & Buyinza (2021) found married households are more likely to receive both formal and informal loans.

Household Sex (hhsex). Male-headed ( $dy/dx = -0.011$ ,  $p = 0.358$ ). Gender is not statistically significant. There is a slight, non-significant decrease in the probability of informal/no credit access for male-headed households. Although women often face structural barriers, social capital via VSLAs may compensate for formal credit exclusion Coleman, (1988); Putnam, (1993). Finscope Uganda (2018) shows women rely heavily on informal credit networks.

Household Income (ln\_hincome).  $dy/dx = 0.014$ ,  $p < 0.001$ . Higher income increases the probability of accessing formal credit by 1.4 percentage points for each 1% increase in income. Consistent with credit rationing theory, where higher-income households are considered lower risk. Beck & Hesse (2009) report income positively correlates with formal credit in Uganda.

Asset Ownership. Owns Assets ( $dy/dx = 0.007$ ,  $p = 0.504$ ). Owning assets has no statistically significant effect on credit access. Informal lenders may not require collateral, while formal institutions may demand formalized land titles, which many households. Collateral theory of lending Besley, (1995) applies, but weak enforcement of property rights in Uganda may limit the effect.

Stability. Somewhat stable ( $-0.009$ ,  $p = 0.349$ ), stable ( $-0.045$ ,  $p = 0.020$ ). Fully stable households are 4.5 percentage points less likely to have no credit access, indicating that household financial stability increases access to formal credit. Credit rationing theory predicts lenders favor stable borrowers to reduce default risk.

Household Size (ln\_hsize).  $dy/dx = 0.033$ ,  $p < 0.001$ . Larger households have a higher probability of accessing informal credit by 3.3 percentage points. Larger households have broader social networks social capital theory, Coleman, (1988), which facilitates informal borrowing.

Urban. Urban ( $dy/dx = -0.037$ ,  $p < 0.001$ ). Being in an urban area reduces the probability of relying solely on informal or no credit by 3.7 percentage points. Urban households are more likely to access formal credit, consistent with financial geography theory. UBOS (2024) reports urban households have higher bank access than rural counterparts.

Region. Eastern ( $0.040$ ,  $p = 0.001$ ), Northern ( $-0.026$ ,  $p = 0.038$ ), Western ( $-0.013$ ,  $p = 0.301$ ). Households in the Eastern region are 4 percentage points more likely to access formal credit.

Northern and Western regions show lower or non-significant formal credit access, highlighting regional disparities. Reflects financial geography theory, where spatial access to banks and MFIs influences credit. Ahaibwe & Kasirye (2020) report higher VSLA participation in Northern Uganda, which may explain informal credit access.

VSLA/SACCO Membership.  $dy/dx = 0.175$ ,  $p < 0.001$ . Membership increases credit access probability by 17.5 percentage points, the largest effect observed. Social capital theory (Coleman, 1988; Putnam, 1993) explains why group membership reduces reliance on formal collateral and increases trust-based lending. FSDU (2018) shows VSLAs and SACCOs significantly expand credit among rural and informal households.

### Model diagnostic tests

#### Multicollinearity

Before fitting the logistic regression model, it is important to verify that the independent variables are not excessively correlated with one another. High multicollinearity can inflate standard errors, distort coefficient estimates, and reduce the reliability of the model. To ensure stable and interpretable results, we assess multicollinearity among the predictors using the correlation matrix diagnostics.

**Table 4. 26: Correlation matrix**

|                    | Household size | Head household age | Household incomes |
|--------------------|----------------|--------------------|-------------------|
| Household size     | 1              |                    |                   |
| Head Household age | 0.0578 (0.00)  | 1                  |                   |
| Household incomes  | 0.0426 (0.00)  | -0.0092 (0.281)    | 1                 |

This matrix reveals a very weak correlation (less than 0.25) between quantitative predictors, this means that, there is no presence of multicollinearity.

#### Linearity

To ensure that the logistic regression model satisfies the assumption of linearity between each continuous predictor and the logit of the outcome, we assess whether the relationship is appropriately modeled as linear. Because logistic regression does not require linearity in the

variables themselves but in their log-odds, we apply the Box–Tidwell test, which provides a simple and effective way to detect violations of this assumption for each continuous predictor in the model. In fact this involved creating interaction terms between each continuous predictor and its natural logarithm, then including these terms in the model. A significant interaction term indicates that the linearity assumption is violated for that variable.

**Table 4. 27: Logistic regression results**

| CreditAccess | Coef. | St.Err. | t-value | p-value | [95% Conf Interval] |       |
|--------------|-------|---------|---------|---------|---------------------|-------|
| hsize        | 1.063 | 0.064   | 1.02    | 0.307   | 0.945               | 1.195 |
| hhage        | 1.34  | 0.053   | 7.41    | 0       | 1.24                | 1.448 |
| HhIncomeT    | 1     | 0       | 4.28    | 0       | 1                   | 1     |
| it1Size      | 0.996 | 0.022   | -0.17   | 0.866   | 0.954               | 1.041 |
| it2Hhage     | 0.939 | .008    | -7.75   | 0       | 0.924               | 0.954 |
| it3Income    | 1     | 0       | -4.17   | 0       | 1                   | 1     |
| Constant     | 0.023 | 0.008   | -10.63  | 0       | 0.012               | 0.047 |

The above results show that the linearity assumption between continuous predictors and the logit of the outcome was assessed using the Box–Tidwell test. The results indicate that household size satisfied the linearity assumption, as the interaction between household size and its natural logarithm was not statistically significant. In contrast, both household head age and household income significantly violated the linearity assumption, suggesting that their relationships with the log-odds of credit access are not linear. These findings imply that modeling age and income as simple linear terms in the logistic regression could produce biased estimates. To address this, transformations such as the natural logarithm, or splines should be applied to these variables to appropriately capture their relationship with the outcome before final model estimation.

## Model validation

**Table 4. 28: VIF Table**

| Variables               | VIF   | 1/VIF |
|-------------------------|-------|-------|
| Region: Central (ref)   |       |       |
| Eastern                 | 1.900 | 0.526 |
| Northern                | 1.850 | 0.541 |
| Western                 | 1.740 | 0.575 |
| Residence:Urban         | 1.160 | 0.863 |
| Sex hhold               | 1.640 | 0.611 |
| Credit type : None      |       |       |
| Formal                  | 1.060 | 0.943 |
| Informal                | 1.090 | 0.921 |
| Education level : None  |       |       |
| Primary                 | 2.110 | 0.473 |
| Secondary               | 2.110 | 0.474 |
| Post secondary          | 1.630 | 0.612 |
| Marital status: Married | 1.960 | 0.510 |
| Own assets: Yes         | 1.030 | 0.975 |
| Stability :Unstable     |       |       |
| Somewhat stable         | 1.120 | 0.896 |
| Stable                  | 1.080 | 0.926 |
| VSLA/Sacco:Is Member    | 1.140 | 0.879 |
| Ln income               | 1.210 | 0.828 |
| Ln house size           | 1.440 | 0.695 |
| Ln hhouse hold age      | 1.170 | 0.854 |
| Mean VIF                | 1.470 |       |

The Variance Inflation Factors (VIFs) for all predictors are low, with values ranging from 1.03 to 2.11, and a mean VIF of 1.47. These values are well below the commonly accepted thresholds for

multicollinearity problem ( $VIF > 5$ ). This indicates that the independent variables included in the model are not strongly correlated with each other.

### Hosmer–Lemeshow test

The goodness-of-fit of the logistic regression model was assessed using the Hosmer–Lemeshow test. The results indicated that the model fits the data well ( $\chi^2 = 59.37$ ,  $df = 48$ ,  $p = 0.1257$ ). Since the p-value exceeds the conventional 0.05 threshold, we fail to reject the null hypothesis of adequate model fit. This suggests that the predicted probabilities from the model are consistent with the observed outcomes, demonstrating that the logistic regression model provides an acceptable fit to the data.

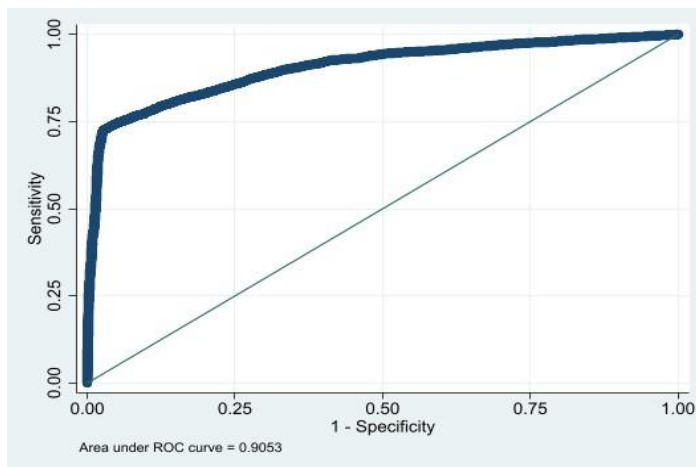
### Likelihood ratio test

A likelihood-ratio test was conducted to compare the reduced model (m2) and the full model (m1). The test statistic was  $LR \chi^2_7 = 7.47$  with a p-value of 0.381, indicating that the additional parameters in the full model do not significantly improve the fit. Thus, the reduced model provides an adequate representation of the data.

### Pseudo R-squared

The binary logistic regression model yielded a pseudo R-squared value of 0.062, suggesting that the included socioeconomic and demographic variables explain approximately 6.2% of the variation in household credit access.

**Figure 4. 5: ROC Analysis**



The ROC curve shows strong discriminative ability of the logistic regression model in predicting credit access. The curve lies well above the diagonal reference line, indicating that the model performs much better than random classification.

The AUC (Area Under the Curve) is 0.9053, which falls in the excellent range (typically AUC > 0.90). This means the model has a very high ability to correctly distinguish between households that have access to credit and those that do not. In practical terms, this indicates that about 90.5% of the time, the model will assign a higher predicted probability to a household with credit access than to a household without it. Overall, the ROC analysis confirms that the model fits the data very well and has strong predictive performance.

#### 4.4. MULTINOMIAL LOGIT MODEL

**Table 4. 29: Cross-Tabulation between Education level and Credit access<sup>2</sup>**

| Education level     | Credit Access |          |          |          |
|---------------------|---------------|----------|----------|----------|
|                     | None          | Formal   | Informal | Total    |
| No Formal Education | 1349658       | 28723.39 | 163882.5 | 1542264  |
|                     | 18.73         | 6.76     | 13.52    | 17.44    |
| Primary             | 3514339       | 154157   | 701425.6 | 4369921  |
|                     | 48.76         | 36.26    | 57.86    | 49.41    |
| Secondary           | 1651245       | 151226.9 | 281057.9 | 2083529  |
|                     | 22.91         | 35.57    | 23.18    | 23.56    |
| Post Secondary      | 691950.8      | 90988.3  | 66010.59 | 848949.7 |
|                     | 9.60          | 21.40    | 5.44     | 9.60     |
| Total               | 7207192       | 425095.6 | 1212377  | 8844665  |
|                     | 100.00        | 100.00   | 100.00   | 100.00   |

Source: UNHS 2019/2020

First row has *frequencies* and second row has *column percentages*

Households with no formal education have the lowest access to both formal 6.76% and informal credit 13.52%. Primary education dominates informal borrowing 57.86%, while secondary and post-secondary groups access more formal credit 35.57% and 21.40%, respectively. Educated individuals are more financially literate and can meet formal institutions' documentation and

collateral requirements World Bank, (2020). Less educated households rely more on informal lenders due to easier access and fewer procedural barriers Demirgüç-Kunt et al., (2022).

**Table 4. 30: Cross-Tabulation between Marital Status and Credit Access<sup>2</sup>**

| Marital Status | Credit Access |          |          |         |
|----------------|---------------|----------|----------|---------|
|                | None          | Formal   | Informal | Total   |
| Not Married    | 2291902       | 106477.2 | 408761.9 | 2807141 |
|                | 31.80         | 25.05    | 33.72    | 31.74   |
| Married        | 4915291       | 318618.4 | 803614.7 | 6037524 |
|                | 68.20         | 74.95    | 66.28    | 68.26   |
| Total          | 7207192       | 425095.6 | 1212377  | 8844665 |
|                | 100.00        | 100.00   | 100.00   | 100.00  |

Source: UNHS 2019/2020

First row has *frequencies* and second row has *column percentages*

Married individuals account for most formal credit 74.95% and informal credit 66.28%. Unmarried individuals have relatively less access, though they make up a substantial share of informal credit 33.72%. Married households often have higher financial stability, joint assets, and creditworthiness, enabling access to formal credit Ellis et al., (2010). Single individuals may face income instability and less collateral, pushing them toward informal borrowing.

**Table 4. 31: Cross-Tabulation between sex of the household head and Credit Access<sup>2</sup>**

| Sex of the household head | Credit Access |          |          |         |
|---------------------------|---------------|----------|----------|---------|
|                           | None          | Formal   | Informal | Total   |
| Female                    | 2275833       | 113587.1 | 434295   | 2823716 |
|                           | 31.58         | 26.72    | 35.82    | 31.93   |
| Male                      | 4931359       | 311508.5 | 778081.5 | 6020949 |
|                           | 68.42         | 73.28    | 64.18    | 68.07   |
| Total                     | 7207192       | 425095.6 | 1212377  | 8844665 |
|                           | 100.00        | 100.00   | 100.00   | 100.00  |

Source: UNHS 2019/2020

First row has *frequencies* and second row has *column percentages*

Male-headed households dominate formal credit 73.28% compared to female-headed 26.72%. However, female-headed households engage slightly more in informal borrowing (35.82%) than in formal. Gender disparities persist in access to formal finance due to employment gaps, lower collateral ownership, and societal roles Fletschner & Kenney, (2014). Women’s stronger participation in informal finance reflects reliance on rotating savings and VSLA groups.

**Table 4. 32: Cross-Tabulation between asset ownership and Credit Access2**

| Owns Assets | Credit Access |          |          |         |
|-------------|---------------|----------|----------|---------|
|             | None          | Formal   | Informal | Total   |
| No          | 5919700       | 326788.4 | 967601.1 | 7214089 |
|             | 82.14         | 76.87    | 79.81    | 81.56   |
| Yes         | 1287493       | 98307.16 | 244775.5 | 1630575 |
|             | 17.86         | 23.13    | 20.19    | 18.44   |
| Total       | 7207192       | 425095.6 | 1212377  | 8844665 |
|             | 100.00        | 100.00   | 100.00   | 100.00  |

Source: UNHS 2019/2020

First row has *frequencies* and second row has *column percentages*

Households owning assets have more access to formal credit 23.13% than those without 76.87%. Non-owners dominate informal borrowing (79.81%) and are most credit-excluded 82.14%. Asset ownership provides collateral and signals financial stability, key determinants for formal lending. Lack of assets excludes many rural or poor households from formal systems, leaving them dependent on informal networks Beck et al., (2018).

**Table 4. 33: Cross-Tabulation between Stability of source of income and Credit Access2**

| Stability | Credit Access |          |          |         |
|-----------|---------------|----------|----------|---------|
|           | None          | Formal   | Informal | Total   |
| Unstable  | 3861140       | 141195.6 | 681182.4 | 4683518 |
|           | 53.57         | 33.22    | 56.19    | 52.95   |

|                 |          |          |          |          |
|-----------------|----------|----------|----------|----------|
| Somewhat Stable | 2989785  | 250290.6 | 476798.4 | 3716874  |
|                 | 41.48    | 58.88    | 39.33    | 42.02    |
| Stable          | 356267.8 | 33609.37 | 54395.8  | 444272.9 |
|                 | 4.94     | 7.91     | 4.49     | 5.02     |
| Total           | 7207192  | 425095.6 | 1212377  | 8844665  |
|                 | 100.00   | 100.00   | 100.00   | 100.00   |

Source: UNHS 2019/2020

First row has *frequencies* and second row has *column percentages*

Stable households have higher formal access 7.91% compared to unstable households 33.22%. Unstable households dominate informal credit 56.19% and non-access (53.57%. Economic or employment stability improves creditworthiness and repayment capacity, enhancing formal access Banerjee & Duflo, (2019). Unstable households face income volatility, making formal lenders perceive them as risky.

**Table 4. 34: Cross-Tabulation between place of residence and Credit Access2**

| Residence | Credit Access |          |          |         |
|-----------|---------------|----------|----------|---------|
|           | None          | Formal   | Informal | Total   |
| Rural     | 4964265       | 280527   | 960686.4 | 6205478 |
|           | 68.88         | 65.99    | 79.24    | 70.16   |
| Urban     | 2242927       | 144568.6 | 251690.2 | 2639186 |
|           | 31.12         | 34.01    | 20.76    | 29.84   |
| Total     | 7207192       | 425095.6 | 1212377  | 8844665 |
|           | 100.00        | 100.00   | 100.00   | 100.00  |

Source: UNHS 2019/2020

First row has *frequencies* and second row has *column percentages*

Urban residents have more access to formal credit 34.01%, while rural households dominate informal borrowing (79.24%. Most credit-inaccessible households are rural 68.88%. Urban areas have higher financial infrastructure (banks, SACCOs, MFIs), while rural households depend on informal sources like friends or community lenders due to physical and informational barriers UBOS, (2021); Allen et al., (2020).

**Table 4. 35: Cross-Tabulation between region and Credit Access<sup>2</sup>**

| Region   | Credit Access |          |          |         |
|----------|---------------|----------|----------|---------|
|          | None          | Formal   | Informal | Total   |
| Central  | 2399559       | 150308.8 | 239129.5 | 2788997 |
|          | 33.29         | 35.36    | 19.72    | 31.53   |
| Eastern  | 1639624       | 54600.12 | 348958.6 | 2043182 |
|          | 22.75         | 12.84    | 28.78    | 23.10   |
| Northern | 1483007       | 49008.71 | 316008.3 | 1848024 |
|          | 20.58         | 11.53    | 26.07    | 20.89   |
| Western  | 1685003       | 171178   | 308280.2 | 2164461 |
|          | 23.38         | 40.27    | 25.43    | 24.47   |
| Total    | 7207192       | 425095.6 | 1212377  | 8844665 |
|          | 100.00        | 100.00   | 100.00   | 100.00  |

Source: UNHS 2019/2020

First row has *frequencies* and second row has *column percentages*

Western and Central regions dominate formal credit access 40.27% and 35.36% respectively. Eastern and Northern regions rely more on informal sources 28.78% and 26.07% and have lower formal access 12.84% and 11.53% respectively. Regional disparities reflect uneven economic development and financial penetration. Central and Western Uganda have more commercial banks and urban centers, while Northern and Eastern lag behind due to conflict legacy and underdeveloped infrastructure UBOS, (2021); IMF, (2022).

**Table 4. 36: Cross-Tabulation between VSLA\_SACCO membership and Credit Access<sup>2</sup>**

| Membership in VSLA or SACCO | Credit Access |          |          |         |
|-----------------------------|---------------|----------|----------|---------|
|                             | None          | Formal   | Informal | Total   |
| Not member                  | 5302913       | 202453.7 | 543511.5 | 6048878 |
|                             | 73.58         | 47.63    | 44.83    | 68.39   |
| Is member                   | 1904280       | 222641.9 | 668865.1 | 2795787 |
|                             | 26.42         | 52.37    | 55.17    | 31.61   |
| Total                       | 7207192       | 425095.6 | 1212377  | 8844665 |
|                             | 100.00        | 100.00   | 100.00   | 100.00  |

Source: UNHS 2019/2020

First row has *frequencies* and second row has *column percentages*

Members of VSLAs/SACCOs dominate both formal 52.37% and informal 55.17% credit access. Non-members are mostly credit-excluded 73.58%. Participation in savings groups enhances financial inclusion by building saving habits, social capital, and credit histories, often serving as gateways to formal institutions Brune et al., (2016); Karlan et al., 201

#### 4.2.4 Multinomial logistic regression

This table presents the coefficients, standard errors, t-values, p-values, and confidence intervals for factors influencing access to credit.

**Table 4. 37: Multinomial logistic regression results**

|           |                           | Delta-method |        |       |           |           |
|-----------|---------------------------|--------------|--------|-------|-----------|-----------|
|           | Marginal effects<br>dy/dx | Std.Err.     | z      | P>z   | [95%Conf. | Interval] |
| ln_hhage  |                           |              |        |       |           |           |
| _predict  |                           |              |        |       |           |           |
| 1         | 0.088                     | 0.012        | 7.050  | 0.000 | 0.063     | 0.112     |
| 2         | -0.088                    | 0.012        | -7.050 | 0.000 | -0.112    | -0.063    |
| 1.Edlevel |                           | (base        |        |       | outcome)  |           |
| 2.Edlevel |                           |              |        |       |           |           |
| _predict  |                           |              |        |       |           |           |
| 1         | -0.046                    | 0.012        | -3.900 | 0.000 | -0.069    | -0.023    |
| 2         | 0.046                     | 0.012        | 3.900  | 0.000 | 0.023     | 0.069     |
| 3.Edlevel |                           |              |        |       |           |           |
| _predict  |                           |              |        |       |           |           |
| 1         | -0.055                    | 0.014        | -3.860 | 0.000 | -0.083    | -0.027    |
| 2         | 0.055                     | 0.014        | 3.860  | 0.000 | 0.027     | 0.083     |
| 4.Edlevel |                           |              |        |       |           |           |
| _predict  |                           |              |        |       |           |           |
| 1         | -0.082                    | 0.021        | -3.930 | 0.000 | -0.122    | -0.041    |
| 2         | 0.082                     | 0.021        | 3.930  | 0.000 | 0.041     | 0.122     |

|                 |        |       |        |       |          |        |
|-----------------|--------|-------|--------|-------|----------|--------|
| 0.MaritalStatus |        | (base |        |       | outcome) |        |
| 1.MaritalStatus |        |       |        |       |          |        |
| _predict        |        |       |        |       |          |        |
| 1               | 0.064  | 0.014 | 4.700  | 0.000 | 0.037    | 0.091  |
| 2               | -0.064 | 0.014 | -4.700 | 0.000 | -0.091   | -0.037 |
| 0.hhsex         |        | (base |        |       | outcome) |        |
| 1.hhsex         |        |       |        |       |          |        |
| _predict        |        |       |        |       |          |        |
| 1               | 0.011  | 0.012 | 0.920  | 0.358 | -0.012   | 0.033  |
| 2               | -0.011 | 0.012 | -0.920 | 0.358 | -0.033   | 0.012  |
| ln_hincome      |        |       |        |       |          |        |
| _predict        |        |       |        |       |          |        |
| 1               | -0.014 | 0.002 | -5.830 | 0.000 | -0.018   | -0.009 |
| 2               | 0.014  | 0.002 | 5.830  | 0.000 | 0.009    | 0.018  |
| 0.OwnsAssets    |        | (base |        |       | outcome) |        |
| 1.OwnsAssets    |        |       |        |       |          |        |
| _predict        |        |       |        |       |          |        |
| 1               | -0.007 | 0.011 | -0.670 | 0.504 | -0.028   | 0.014  |
| 2               | 0.007  | 0.011 | 0.670  | 0.504 | -0.014   | 0.028  |
| 1.Stability     |        | (base |        |       | outcome) |        |
| 2.Stability     |        |       |        |       |          |        |
| _predict        |        |       |        |       |          |        |
| 1               | 0.009  | 0.009 | 0.940  | 0.349 | -0.009   | 0.026  |
| 2               | -0.009 | 0.009 | -0.940 | 0.349 | -0.026   | 0.009  |
| 3.Stability     |        |       |        |       |          |        |
| _predict        |        |       |        |       |          |        |
| 1               | 0.045  | 0.019 | 2.320  | 0.020 | 0.007    | 0.083  |
| 2               | -0.045 | 0.019 | -2.320 | 0.020 | -0.083   | -0.007 |
| ln_hsize        |        |       |        |       |          |        |
| _predict        |        |       |        |       |          |        |

|              |        |       |         |          |        |        |
|--------------|--------|-------|---------|----------|--------|--------|
| 1            | -0.033 | 0.008 | -4.060  | 0.000    | -0.049 | -0.017 |
| 2            | 0.033  | 0.008 | 4.060   | 0.000    | 0.017  | 0.049  |
| 0.urban      |        | (base |         | outcome) |        |        |
| 1.urban      |        |       |         |          |        |        |
| _predict     |        |       |         |          |        |        |
| 1            | 0.037  | 0.010 | 3.610   | 0.000    | 0.017  | 0.057  |
| 2            | -0.037 | 0.010 | -3.610  | 0.000    | -0.057 | -0.017 |
| 1.region     |        | (base |         | outcome) |        |        |
| 2.region     |        |       |         |          |        |        |
| _predict     |        |       |         |          |        |        |
| 1            | -0.040 | 0.012 | -3.280  | 0.001    | -0.064 | -0.016 |
| 2            | 0.040  | 0.012 | 3.280   | 0.001    | 0.016  | 0.064  |
| 3.region     |        |       |         |          |        |        |
| _predict     |        |       |         |          |        |        |
| 1            | 0.026  | 0.013 | 2.070   | 0.038    | 0.001  | 0.051  |
| 2            | -0.026 | 0.013 | -2.070  | 0.038    | -0.051 | -0.001 |
| 4.region     |        |       |         |          |        |        |
| _predict     |        |       |         |          |        |        |
| 1            | 0.013  | 0.012 | 1.030   | 0.301    | -0.011 | 0.037  |
| 2            | -0.013 | 0.012 | -1.030  | 0.301    | -0.037 | 0.011  |
| 0.VSLA_SACCO |        | (base |         | outcome) |        |        |
| 1.VSLA_SACCO |        |       |         |          |        |        |
| _predict     |        |       |         |          |        |        |
| 1            | -0.175 | 0.010 | -17.510 | 0.000    | -0.194 | -0.155 |
| 2            | 0.175  | 0.010 | 17.510  | 0.000    | 0.155  | 0.194  |

Note: dy/dx for factor levels is the discrete change from the base level.

Source: UNHS 2019/2020

Urban–Rural Location. The marginal effects indicate that rural households have a higher probability of accessing credit mainly informal than urban households. Although unexpected, this

aligns with financial inclusion theory, which recognizes that VSLAs, SACCOs, and community lending schemes dominate rural Uganda and reduce barriers such as collateral and paperwork Ahaibwe & Kasirye, (2020).

The finding also fits Stiglitz and Weiss's (1981) model, where formal lenders ration risky borrowers, pushing rural households toward informal lenders that rely on social ties rather than collateral. Similar evidence appears in Okurut et al. (2011), who find strong rural reliance on informal credit in Uganda.

Urban households show lower probabilities of overall credit access because when they are excluded from formal credit, they do not substitute with informal sources as much, consistent with Beck & Demirgüç-Kunt (2008) who note urban borrowers' stronger preference for formal institutions.

Regional Differences. Marginal effects show statistically significant differences across regions. Households in the Central region have the highest probability of accessing formal credit, reflecting dominance of commercial banks and MFIs, consistent with Kasirye (2015). Northern and Eastern regions display higher informal credit participation, supporting financial geography theory, which argues that spatial disparities in infrastructure and financial density affect access Beck et al., (2007). These results also mirror evidence from Ahaibwe & Kasirye (2020) on VSLA penetration in rural Northern Uganda.

Gender of Household Head. There is no statistically significant gender gap in accessing either formal or informal credit. Male-headed households exhibit higher marginal effects for formal credit access, while female-headed households show greater reliance on informal lenders. This pattern aligns with the information asymmetry framework, where women face greater rationing due to limited collateral and perceived default risk Fletschner, 2(009).

Comparative evidence from Johnson & Nino-Zarazúa (2011) and Ahaibwe & Kasirye (2020) confirms that women participate more in group lending and VSLAs, consistent with the higher predicted probability of informal credit in our results.

Marital Status. Marginal effects indicate that married households have a significantly higher probability of accessing both formal and informal credit than single, widowed, or divorced individuals.

This is consistent with credit rationing theory, which suggests that lenders prefer borrowers with stable household structures that signal lower risk (Stiglitz & Weiss, 1981). Similar findings are reported by Mpiira & Buyinza (2021), showing marital stability improves creditworthiness and collateral availability.

**Education Level.** Education increases the probability of formal credit access while reducing the probability of having no credit at all. This reinforces the information asymmetry model, where educated borrowers send stronger “information signals” to lenders Stiglitz & Weiss, (1981). Previous research by Karlan & Morduch (2010) and Kariuki & Omagwa (2020) confirms that education enhances financial literacy and lender confidence.

**Income.** Higher income levels significantly increase the probability of accessing formal credit. This result fits the credit rationing theory, which reduces lender risk and improves screening accuracy. The findings closely align with Beck et al. (2007) and Okurut et al. (2011), who show that wealthier households face lower credit rationing in East Africa. Low-income households show higher marginal effects for informal borrowing, consistent with Beck & Demirgüç-Kunt (2008) who argue that informal lenders substitute for formal institutions when collateral is lacking.

**Age of Household Head.** The marginal effects show that middle-aged individuals have the highest predicted probability of accessing both formal and informal credit, reflecting their relatively greater income stability and credit reputation. This matches the life-cycle borrowing behavior described in financial inclusion literature Kisaka & Oburu, (2019). Younger and older households show higher probabilities of no credit access, aligning with theoretical expectations that lenders ration borrowers with limited experience or declining future earnings potential Stiglitz & Weiss, (1981).

**Household Size.** Larger households have higher predicted probabilities of informal credit use, likely due to broader social networks, and lower probabilities of formal access. This finding is consistent with Ahaibwe & Kasirye (2020), who note that VSLAs and group mechanisms favour households with stronger community ties.

**VSLA/SACCO Membership.** Marginal effect. $\frac{dy}{dx} = 0.175$ ,  $p < 0.001$ . Membership in a VSLA or SACCO increases the probability of accessing credit by 17.5 percentage points, the largest effect among all variables. Members are more likely to obtain informal credit but also have increased

access to formal credit through group guarantees or pooled savings. This aligns with Social Capital Theory (Coleman, 1988; Putnam, 1993), where trust, networks, and community ties reduce information asymmetries and collateral requirements. FSDU (2018) and UMRA (2023) show VSLA/SACCO membership significantly improves household credit access in Uganda. Jack & Suri (2014) emphasize that group-based lending reduces lender risk and transaction costs, making credit more inclusive.

Asset Ownership. Marginal effect:  $dy/dx = 0.007$ ,  $p = 0.504$  (not statistically significant). Asset ownership (e.g., land, property) does not significantly change the probability of accessing formal or informal credit. Households with assets are not automatically able to obtain loans, likely due to informal documentation, weak property rights, or lender distrust. Related to Collateral Theory of Lending Besley, (1995), which posits that pledging assets reduces lender risk. The weak effect reflects Uganda's structural barriers, such as lack of formal land titles or legal ownership documentation. Beck et al. (2007) and Okurut et al. (2011) highlight that many low-income households in Uganda cannot leverage assets for formal credit. Bongomin & Ntayi (2020) note that digital loans can partially substitute for collateral, addressing this limitation.

Household Stability. Marginal effect; Somewhat stable:  $dy/dx = -0.009$ ,  $p = 0.349$  (not significant) Stable:  $dy/dx = -0.045$ ,  $p = 0.020$  (significant). Financially stable households are 4.5 percentage points more likely to access credit and less likely to have no credit. Stability reflects predictable income streams, reliable repayment capacity, and reduced lender risk. Informal credit is less sensitive to household stability due to flexible trust-based arrangements. Linked to Credit Rationing Theory (Stiglitz & Weiss, 1981), where lenders screen borrowers based on stability to reduce default risk. Also aligns with Transaction Cost Theory Coase, (1937); Williamson, (1981), as stable households reduce monitoring and enforcement costs for lenders. Beck & Hesse (2009) and Ahaibwe & Kasirye (2020) find that household financial stability is a key determinant of formal credit access in Uganda. Jack & Suri (2014) note that stable households also better utilize digital and group-based credit.

## CHAPTER FIVE

### CONCLUSIONS AND POLICY RECOMMENDATIONS

#### 5.1 Conclusions

This study examined the determinants of credit access in Uganda based on the hypothesis that socioeconomic, demographic, and institutional factors significantly influence both the likelihood of accessing credit and the type of credit used. Using binary and multinomial logistic regression models, the results confirmed most of these hypotheses.

Credit access remains low, with only 22.8% of households borrowing in the past year, and informal lenders dominating the market (13.7%) compared to formal institutions (4.8%) (Finscope Uganda, 2023; Bank of Uganda, 2023). The binary logistic model showed that education, income, household size, and group membership significantly influenced whether a household accessed credit, supporting the hypothesis that socioeconomic factors affect borrowing decisions.

The multinomial model provided deeper insights by distinguishing between formal and informal credit. It showed that education and income increase the likelihood of accessing formal credit, while household size and VSLA/SACCO membership are strongly associated with informal borrowing. Regional disparities particularly the low access in Northern Uganda further confirmed the hypothesis that demographic and geographic factors shape credit outcomes.

Overall, the findings show that Uganda's credit market is dualistic, with formal credit reaching a small segment of educated and higher-income households, while informal systems serve the majority. The study therefore concludes that credit access in Uganda is determined by interconnected socioeconomic, demographic, and institutional drivers, consistent with the study's hypotheses.

#### 5.2 Policy Recommendations

Policy recommendations are grouped into short-term (1–3 years) and long-term (3–10 years) actions.

## **Short term recommendations**

Strengthen VSLAs and SACCOs. VSLA/SACCO membership showed the strongest positive statistical effect on credit access, consistent with Munyegeera and Matsumoto (2016). The Microfinance Support Centre (MSC) and Uganda Cooperative Alliance should provide technical training, digital record-keeping systems, and financial linkages between SACCOs/VSLAs and commercial banks to increase liquidity and expand loanable funds. UMRA, Bank of Uganda should provide consumer protection training to reduce risks of mismanagement.

Promote Digital and Fintech-Based Credit Solutions. Urban households had significantly higher access to formal credit; digital finance reduces distance, cost, and documentation barriers (World Bank, 2020). The Bank of Uganda should promote the integration of digital lending, mobile credit scoring, and fintech innovations into the national financial inclusion framework. Evidence from similar contexts shows that mobile money and digital finance significantly enhance financial inclusion Munyegeera & Matsumoto,( 2016); World Bank, (2020).

Address Regional Disparities. The Northern region had the lowest probability of accessing credit (both formal and informal), while the Central and Eastern regions had higher access levels, largely due to better financial infrastructure. The Ministry of Finance, Planning and Economic Development (MFPED) should prioritize financial inclusion interventions in the Northern region through targeted programs that integrate credit access with livelihood projects.

## **Long-term recommendations**

Integrate Financial Education into the National Curriculum. The government, through the Ministry of Education and Sports and Bank of Uganda, should integrate financial literacy programs into school curricula, vocational training centers, and adult education. Financial Sector Deepening Uganda (FSDU) and other development partners should intensify awareness campaigns that promote understanding of savings, budgeting, credit management, and digital finance. Such initiatives would improve credit uptake by reducing information asymmetry and helping borrowers make informed decisions Demirgüç-Kunt et al., (2022); Beck et al., (2019).

Strengthen National Credit Reference Systems. Low-income borrowers often lack credit histories, hindering access to formal credit BoU, (2023). Bank of Uganda, Credit Reference Bureaus, UMRA should mandate SACCOs, VSLAs, and fintech lenders to report borrower data to credit reference

bureaus, promote awareness of credit scoring and responsible borrowing, develop a unified national borrower database.

Expand Rural Financial Infrastructure. Urban residence significantly increased access to formal credit; rural infrastructure remains limited Finscope Uganda, (2023). The Ministry of Finance planning and Economic development, Bank of Uganda in partnership with telecom companies, NITA should establish sub-county financial service hubs combining banking, SACCO, and mobile-money services and promote agency banking to reach remote communities.

### **5.3 Areas for further research**

Future studies should employ longitudinal data to track how household characteristics influence credit access over time UBOS, (2024).

Investigate the role of government regulations and institutional efficiency in promoting or hindering credit access

Assess how interest rates, repayment terms, and loan sizes affect welfare improvement among borrowers. ng credit access across regions BoU (2023).

Examine how mobile money, fintech innovations, and digital credit services are transforming rural access to credit World Bank, (2020)

### **5.4 Limitations of the study**

While this study provides valuable insights, it was subject to several limitations:

The use of the 2019/2020 UNHS data, which is cross-sectional, limits the ability to analyze changes in household credit behavior over time.

Since the survey relied on respondents' self-reported information, issues of recall bias or underreporting may affect data accuracy.

Despite these limitations, the study provides a robust and representative analysis of the determinants of credit access in Uganda and contributes to the literature on financial inclusion in developing economies.

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