

## Factors affecting access to agricultural credit and the size of agricultural credit for smallholder farmers in Zimbabwe

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### Abstract

Access to agricultural credit is essential for increasing the productivity and livelihoods of smallholder farmers in Zimbabwe. Nevertheless, persistent systemic challenges constrain access to and the amounts of loans available to the farmers. This study explores the key determinants of access to agricultural credit and loan amounts offered to farmers in Mashonaland East province. Using a double-hurdle model, the study analyzes the decision to apply for credit and determinants of loan amounts obtained. Findings indicate that farm size, age, membership in savings groups, and financial literacy are significant factors in credit access, while collateral requirements and perceived risk remain significant barriers. Larger farms and savings group membership were positively associated with loan sizes. The research highlights the need for inclusive credit policies, flexible collateral conditions, and digital financial services to bridge the financing gap. Overcoming these challenges is crucial in fostering financial inclusion and developing the agricultural sector in Zimbabwe.

**Keywords:** Agricultural Credit, Loan Size, Financial Inclusion, Smallholder Farmers, Zimbabwe Agriculture

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## 1. Introduction

Agriculture is a vital part of Zimbabwe's economy, contributing about 17% to the Gross Domestic Product (GDP), 40% of export revenues, and providing jobs for nearly 70% of the workforce (World Bank, 2024). Smallholder farmers, who make up 70% of the farming population in Zimbabwe, play a crucial role in the agricultural sector (Mafirakurewa, 2023). They contribute over 70% of the national maize and tobacco production (FAO, 2024), making them essential for ensuring household food security and strengthening the agriculture sector. Despite their socio-economic importance, smallholder farmers face numerous challenges, with limited access to agricultural credit and appropriately sized loans ranking among the most critical (World Bank, 2024).

Smallholder farmers are generally defined as those who manage small plots of land, typically less than 2 hectares (FAO, 2024). They primarily rely on family labour for agricultural production and operate within various farming systems. These farmers often grow subsistence crops and engage in small-scale livestock production. In Zimbabwe, smallholder farmers are those who reside in communal lands, old resettlement areas, and A1 farms, which measure 5 to 6 hectares for cropping and up to 15 hectares for communal grazing (Mafirakurewa, 2023). The Fast Track Land Reform (FTLR) program, which began in 2000, created two main types of resettlement farms: the smaller A1 scheme and the medium to large A2 scheme (Kuipa, 2019).

Access to agricultural credit is a cornerstone of modern agricultural development (Reyes, Shumway, & Tong, 2023). It enables farmers to invest in quality inputs, adopt innovative technologies, and enhance their resilience against climate shocks. It provides farmers the resources to purchase inputs, adopt improved technologies, and invest in infrastructure. This is critical to providing food for over nine billion people by 2050 (World Bank, 2024). For smallholder farmers, having access to credit can be the key difference between merely subsistence farming and achieving sustainable livelihoods. Agriculture credit refers to loans and advances given to farmers by the financial sector for agricultural production (FAO, 2024). It can be categorized into short-term (6-18 months) for operational costs and inputs, medium-term (2-5 years) for machinery and implements, and long-term (over 5 years) for investing in immovable property and assets that support crop and livestock production. The size of loans is equally critical, as insufficient financing can limit the potential benefits of credit access. For example, a farmer may obtain credit to buy seeds but may lack enough funds for fertilizers, irrigation, or labour, which are also necessary for successful farming.

Globally, the importance of agricultural credit for smallholder farmers has been well documented. For example, in India, microfinance institutions and rural banks have played an instrumental role in transforming agricultural productivity by providing accessible and affordable credit (Balana & Olanrewaju, 2024). In Asia and Sub-Saharan Africa, the agricultural sector's dependence on smallholder farming is even more pronounced, with approximately 70% of the population relying on agriculture for their livelihoods (Touch, et al., 2024). Forbes estimates that there are between 450 to 500 million smallholder farmers globally, with the majority residing in Asia and Sub-Saharan Africa. Smallholder farmers constitute 90% of the farming population in these regions and are responsible for 80% of food production (FAO, 2024). Yet, access to credit remains a significant barrier for many smallholder farmers, with less than 10% of African smallholder farmers accessing formal financial services (World Bank, 2024).

Several studies have attempted to quantify the funding gap for agricultural credit to smallholder farmers, highlighting the substantial shortfall in meeting their financial needs. The Mastercard Foundation estimates that smallholder farmers require approximately US\$50 billion annually in credit. Yet, formal financial institutions provide only \$14 billion, with the remainder coming from value chain actors (\$17 billion) and informal sources (\$25 billion) (World Bank, 2024). Similarly, the International Fund for Agricultural Development (IFAD) reported a global funding gap of \$75 billion annually for smallholder agricultural finance based on 2019/2020 calculations (FAO, 2024). One Acre Fund underscores this challenge in the context of climate resilience, estimating that \$153 billion per year is needed globally to support smallholder farmers. Still, only \$2 billion in climate finance currently reaches them, leaving a \$151 billion shortfall (World Bank, 2024). The Food and Agriculture Organization (FAO) also identifies a broader need for \$680 billion annually to transform agrifood systems and meet the Sustainable Development Goals (SDGs) (FAO, 2024). Although the numbers vary, the key message remains the same: the financing gap for millions of smallholder farmers is significant. This highlights the urgent need for targeted financial strategies to address the ongoing funding shortfalls in smallholder agriculture.

In Zimbabwe, approximately 8% of smallholder farmers access formal agricultural credit annually (FAO, 2024), reflecting systemic challenges in the agricultural credit market, including limited financial inclusion and inadequate support for smallholder farmers. This has been confirmed by several studies, such as those by (Dawes & Mushongachware, 2024), (Mafirakurewa, 2023) and (Kuipa, 2019). According to these studies, smallholder farmers primarily use their savings for agricultural financing. In most cases, however, their resources are insufficient to cover seasonal cashflows. Mashonaland East province, a key agricultural region in Zimbabwe, exemplifies these challenges. While smallholder farmers dominate agricultural production, their access to formal credit is constrained by factors such as lack of collateral, high interest rates, and an underdeveloped rural agriculture finance market (Chandio, et al., 2021). Where smallholder farmers have accessed agricultural credit, the size of loans available has often been insufficient to meet their needs, further hindering their capacity to improve productivity and livelihoods (Haryanto, Wardana, Jamil, Brintanti, & Ibrahim, 2023). Addressing these issues is crucial for fostering sustainable rural development and achieving national food security goals.

There is an increasing amount of literature on agricultural credit in Zimbabwe; however, several gaps remain. Existing studies often emphasize credit availability but do not sufficiently address the factors influencing smallholder farmers' access to credit and the size of the loans they receive. While previous research highlights the roles of various entities in the agricultural credit market—such as banks, microfinance institutions, and cooperatives—it rarely examines the dynamics of demand and supply, particularly in the rural context of Zimbabwe.

This study aims to fill these gaps by providing a detailed analysis of the factors that affect access to agricultural credit and the size of loans for smallholder farmers in Mashonaland East province. By examining the demand and supply sides of the agricultural credit market, this research offers a comprehensive understanding of the barriers and opportunities within this vital sector. Additionally, the study seeks to contribute to policy discussions on financial inclusion, agricultural sector reforms, and rural livelihoods in Zimbabwe.

## 2. Overview of the supply of credit to the agriculture sector in Zimbabwe

The supply of credit to the agriculture sector in Zimbabwe is critical for boosting productivity, ensuring food security, and supporting rural livelihoods. Agricultural credit in Zimbabwe encompasses both formal and informal sources (Dawes & Mushongachware, 2024). Formal credit is provided by commercial banks, microfinance institutions, savings and credit cooperatives (SACCOs), and government-backed financial entities such as the Agricultural Finance Corporation (AFC) and the Infrastructure Development Bank of Zimbabwe (IDBZ). Informal sources include community savings groups, private moneylenders, and input suppliers offering credit through contract farming arrangements. The amount of agricultural credit provided by these sources to smallholder farmers in 2024 is shown in Figure 1 below.

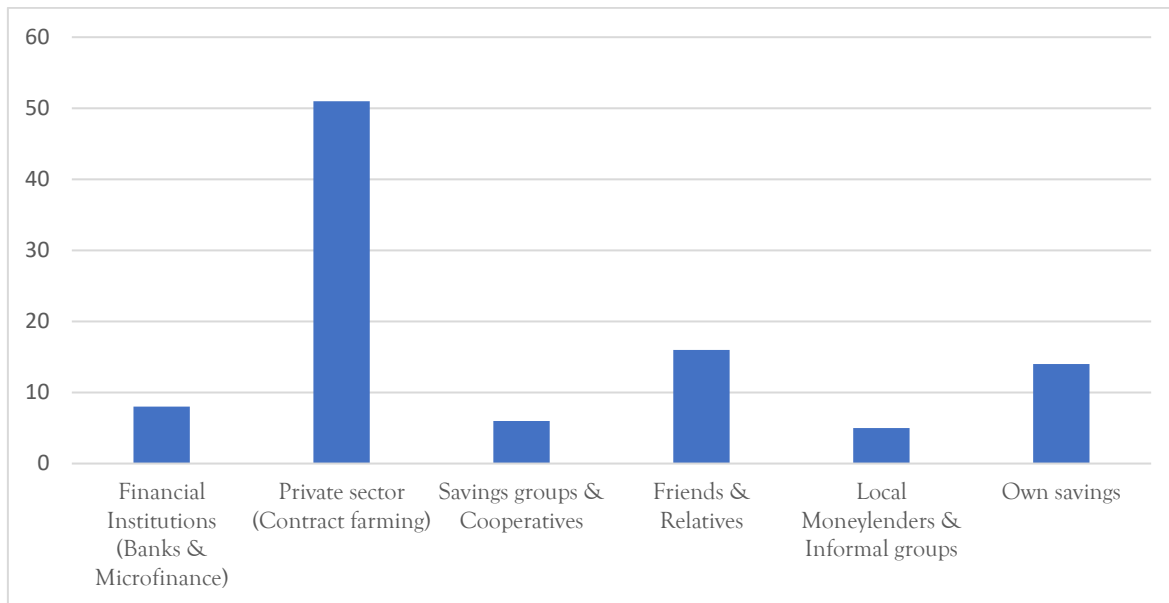


Figure 1: Sources of loans for smallholder farmers in Zimbabwe in the 2023/24 summer agricultural season (FAO, 2024)

The prevalence of contract farming underscores the reliance on private sector initiatives to finance Zimbabwe's smallholder agriculture while formal financial institutions remain underutilized (Dawes & Mushongachware, 2024). Community-based financing mechanisms play a role but are often unstructured and riskier, highlighting persistent challenges in smallholder lending.

According to the Reserve Bank of Zimbabwe (RBZ) 2025 Monetary Policy Statement, Zimbabwe has 300 formal financial institutions, comprising 19 banks, 277 microfinance institutions (MFIs), and four development finance institutions (DFIs). As of January 2025, total loans and advances in the banking sector stood at Zimbabwe Gold (ZiG) 50.33 billion (USD 1.97 billion), representing 31.2% of total assets (RBZ, 2025). Due to high demand for stable currency financing, 88.2% of total loans were denominated in foreign currency, mainly USD. The productive sectors received 72.3% of total loans, yet agriculture accounted for only 14.7% (USD 289.59 million). Despite the sector's importance, fewer than 10% of smallholder farmers access these loans (AfDB, 2024). The non-performing loan (NPL) ratio stood at 3.4%, within the international threshold of 5% (RBZ, 2025).

Zimbabwe's smallholder farmers make up 70% of the total farming population but face an annual credit shortfall of USD 750 million to USD 1.5 billion (FAO, 2024). Currently, they only access 8% of the USD 598.64 million available from formal financial institutions, with USD 200 million coming from contract farming (Mafirakurewa, 2023). This financial gap limits investment in productivity-enhancing inputs, modern techniques, and climate-resilient practices (Dawes & Mushongachware, 2024). Addressing this issue is crucial for agricultural productivity, food security, and rural development. Identifying the factors influencing credit access and loan sizes will inform policies and financial innovations to close this gap and improve smallholder contributions to Zimbabwe's agricultural economy.

To improve financial inclusion, the RBZ launched the National Financial Inclusion Strategy (NFIS) in 2016, currently in its second phase (2022–2026). The strategy aims to enhance financial access through capacity building and tailored financial products (RBZ, 2025). Government-led programs such as AFC, Command Agriculture, and Pfumvunza/Intwasa seek to improve credit access (Mafirakurewa, 2023). However, delays, politicization, and inadequate monitoring have undermined their effectiveness (Kuipa, 2019). Additionally, donor-funded initiatives and development banks like the African Development Bank (AfDB) provide value chain financing and blended models, though their coverage remains limited.

### 3. Empirical framework

#### 3.1. Data

The study was conducted in nine rural districts of Mashonaland East province in Zimbabwe. A systematic questionnaire was developed to collect quantitative data for the research. The Research Ethics Committee of the Agribusiness and Management Department at Marondera University of Agricultural Sciences and Technology (MUASt) approved the structured questionnaire used in this study (Approval number MUASt 03/24) under the MUASt Research Ethics Policy (2020). The primary data sources for this study were smallholder farming households. Data were collected from a sample of 442 households through face-to-face interviews using a structured questionnaire—the first part of the questionnaire aimed to identify the socio-demographic characteristics of the respondents' households. The second part included questions on several broad categories: agricultural status, demand and supply of agricultural credit, financial services and products, financial literacy, and household income estimation. The sample unit consisted of household heads who were farmers, aged over 18, and engaged either in the official financial market or not. The sample size for the household survey was calculated using a derivative of Yamane's formula for calculating sample size when population size is finite (Sorzano, 2022). The strategy for sampling respondents involved random selection of villages within each ward, followed by systematic sampling. The study relied mainly on the Lot Quality Assurance Sampling (LQAS) techniques (Kamau, Majiwa, Otieno, & Kabuage, 2024). Using the LQAS, 24 wards were selected to represent the various agro-ecological zones in the province for the study.

#### 3.2. Methods of Analysis

This study used quantitative methods, including descriptive analysis, inferential statistics, and regression analysis. The study employs a double-hurdle model to analyze smallholder farmers' access to agricultural credit. The first stage uses a Probit model to examine the binary decision of whether a farmer applies for credit, with the outcome set to 1 if they apply and 0 otherwise. Key influencing factors include socioeconomic characteristics, income, savings, credit history, and perceptions of financial institutions. The second stage applies a Tobit model to analyze the amount of credit received, conditional on application. This stage considers institutional factors, loan terms, policy environment, and market conditions that impact credit availability. Zero values arise due to inaccessibility or voluntary exclusion (Kuipa, 2019). These models are illustrated below:

$$\begin{aligned}
 y_{i1} &= w_i \alpha + v_i && \text{Participation Decision} \\
 y_{i2} &= x_i \beta + \mu_i && \text{Credit Amount} \\
 y_i &= x_i \beta + \mu_i && \text{if } y_{i1} > 0 \quad y_{i2} > 0 \\
 y_i &= 0 && \text{Otherwise}
 \end{aligned} \tag{3.1}$$

Where,  $y_{i1}$  is the latent variable that describes the household's decision to participate in credit finance,  $y_{i2}$  is the latent variable that describes the amount of the smallholder's acquisition,  $y_i$  is the observed dependent variable,  $w_i$  is a vector of variables explaining the participation decision,  $x_i$  is a vector of variables explaining the acquisition decision. Vector of error terms,  $v_i$  and  $\mu_i$ , are assumed to be independent and distributed as  $v_i \sim N(0,1)$  and  $\mu_i \sim N(0,\sigma^2)$ .

Maximal Likelihood Estimation (MLE) procedures are used to estimate the model. Specification adjustments are needed to overcome the inconsistency of such estimates in the presence of heteroscedasticity and non-normality of the error terms. To account for heteroscedasticity, the variance of errors is specified as a function of continuous variables and the standard deviation as:

$$\sigma_i = \exp(Z_i' h)$$

where  $Z_i$  are some elements of  $x_i$ . Based on the inverse hyperbolic sine (IHS) transformation of the dependent variable, consistent parameter estimates will be produced for both models when non-normality is present (Mullahy & Norton, 2024). This transformation was first applied to Tobit models by Reynolds and Shonkwiler (Kuipa, 2019). The double-hurdle model is transformed as follows:

$$T(\theta y_i) = \log \left[ \theta y_i + (\theta^2 y_i^2 + 1) \frac{1}{2} \right] / \theta = \sinh \sinh^{-1}(\theta y_i) / \theta \tag{3.2}$$

where  $\theta$  is an unknown parameter. As Reynolds and Shonkwiler (1991) pointed out, the likelihood equation for the independent double hurdle model with heteroscedasticity and non-normal error structure is as follows:

$$L(\alpha, \beta, h, \theta) = \Pi_0 \left[ 1 - \phi(w_i' \alpha) \phi \left( \frac{x_i' \beta}{\sigma_i} \right) \right] \times \Pi_1 \left[ (1 + \theta^2 y_i^2)^{-0.5} \phi(w_i' \alpha) \sigma_i^{-1} \phi \left( \frac{T(\theta y_i) - x_i' \beta}{\sigma_i} \right) \right] \tag{3.3}$$

The authors point out that a double-hurdle model should not be interpreted like a linear regression model. Instead, an analysis of marginal effects is needed to understand how the independent variables impact the dependent variable. To do this, the overall average is broken down into the impact on the likelihood of an event occurring and the effect on the amount of the event when it does occur. Then, these effects are examined for each explanatory variable. The breakdown of the overall average looks like this:

$$E(y|x_i) = P(y_i > 0)E(y_i|y_i > 0) \quad (3.4)$$

Participation probability and credit amount based on participation are as follows:

$$P(y_i > 0) = \phi(w_i' \alpha) \phi\left(\frac{x_i' \beta}{\sigma_i}\right) \quad (3.5)$$

$$E(y_i|y_i > 0) = \phi\left(\frac{x_i' \beta}{\sigma_i}\right) \int_0^{\infty} \left(\frac{y_i}{\sigma_i \sqrt{a^2 + b^2}} \phi\left(\frac{T(\theta y_i) - x_i' \beta}{\sigma_i}\right)\right) dy_i \quad (3.6)$$

When calculating elasticity at the sample means, the marginal effects are applied to the continuous explanatory variables. For discrete or categorical variables, the marginal effects are used to calculate the percentage changes in the dependent variable when the variable shifts from 0 to 1, *ceteris paribus*. Therefore;

$$y = \begin{cases} 1, & \text{if farmer is a participant} \\ 0, & \text{if otherwise} \end{cases} \quad (3.7)$$

### 3.3. Model Specification

**First Hurdle: Probit Model: Determinants of access and participation**

$$A_{iaf}^* = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + \varepsilon_{iaf} \quad (3.8)$$

Where,

- $A_{iaf}^*$  is the latent (unobserved) dependent variable, Agricultural finance access decision.
- $\beta_0$  is a constant and  $\beta_1 - \beta_{15}$  are the coefficients to be estimated.
- $X_1 - X_{15}$  are the independent variables (Age of the household head, Gender of the household head, Household head's level of education, Farmer saves money, Farmers' perception of the loan repayment period, Farmers' perception of lending procedures, Opportunity to take a second loan, Financial market proximity, Family labour, Farm size, Total livestock ownership, Attitude towards risk, Extension Contact, Experience in credit use and Membership to savings group).
- $\varepsilon_{iaf}$  is the stochastic error term, which follows a standard normal distribution  $N(0,1)$ .

**Second Hurdle: Amount of Credit Received: Determinants of Participation Intensity**

$$Y_i^* = X'_{i2} \beta_2 + v_i, v_i \sim N(0, \sigma^2) \quad (3.9)$$

Where,  $Y_i$  is the identified amount of loan borrowed by the respondents and  $Y^* \geq 0$ .

The truncated Tobit model accounts for censoring in the dependent variable. It is handy for modelling situations where the dependent variable is only observed within a specific range (truncated) and thus provides insights into the intensity level of an outcome. truncated Tobit model used for the study is given below:

$$Y_{iaf}^* = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + \varepsilon_{iaf} \quad (3.10)$$

Where,

- $Y_{iaf}^*$  is the latent (unobserved) dependent variable, Agricultural finance intensity.
- $\beta_0$  is a constant and  $\beta_1 - \beta_{15}$  are the coefficients to be estimated.
- $X_1 - X_{15}$  are the independent variables (Age of the household head, Gender of the household head, Household head's level of education, Farmer saves money, Farmers' perception of the loan repayment period, Farmers' perception of lending procedures, Opportunity to take a second loan, Financial market proximity, Family labour, Farm size, Total livestock ownership, Attitude towards risk, Extension Contact, Experience in credit use and Membership to savings group).
- $\varepsilon_{iaf}$  is the stochastic error term, which follows a standard normal distribution  $N(0, \sigma^2)$ .

### 3.4. Description of variables for the double hurdle model

Defining variables in the double-hurdle model is crucial for understanding the factors influencing the decision to apply for agricultural credit and the amount of credit received. The dependent variable captures both participation and intensity of credit use. In the first hurdle, a binary choice model determines whether a farmer applies for credit (1 if they apply, 0 otherwise). The latent dependent variable  $A_{iaf}^*$  represents farmers' access to financial markets. The second hurdle examines the continuous variable  $Y_{iaf}^*$ , which represents the amount of credit received and is conditional on application approval. This approach helps identify distinct barriers affecting access and the sufficiency of agricultural credit in Zimbabwe (Odhambo, Gathungu, & Opondo, 2023).

A comprehensive set of explanatory variables is included to account for both demand- and supply-side determinants (Kamau, Majiwa, Otieno, & Kabuage, 2024). Demand-side factors include demographic characteristics such as age, gender, education level, household size, and farm size. Economic factors like household income, off-farm earnings, and asset ownership influence participation. Supply-side factors include interest rates, collateral requirements, financial service accessibility, and institutional presence. Social capital variables—such as membership in farmer groups and participation in agricultural extension programs—also shape credit access and utilization. The model thus provides a holistic analysis of credit market dynamics for Zimbabwean smallholder farmers. The demographic, farm characteristics, institutional and socio-economic variables included in the double hurdle model are summarized in Table 1 below:

Table 1: Variables included in the double hurdle model

| Variables                      |   | Description of variables                                     | Measurements  | Expected sign |
|--------------------------------|---|--|---|---------------|
| Dependent                      | Credit Access                                     | Dummy  | (1 = Yes, 0 = No)   | +/-           |
|                                | Accessible credit                                 | Discrete   | Amount  | +/-           |
| Independent                    | Age of the household Head (X1)                    | Continuous   | Number  | +/-           |
|                                | Gender of household Head (X2)                     | Dummy  | 1 = Male<br>0 = Female  | +             |
|                                | Number of years in formal education (X3)          | Continuous   | Illiterate = 0<br>Adult education = 2 (average for adult literacy programs)<br>Primary = 7<br>Secondary = 11<br>High school = 13<br>College or Vocational = 15 (2 years post-secondary or high school)<br>University = 16+ (3 years post-high school) | +             |
|                                | Family Labour Endowment (X4)                      | Male equivalents   | < 9 years = 0<br>9- 15 = 0.7<br>16- 49 = 1<br>> 49 = 0.7  | -             |
|                                | Farm Size (X5)                                    | Continuous   | Hectares  | +             |
|                                | Total Livestock Ownership (X6)                    | Tropical Livestock Unit                                      | Cattle = 0.7<br>Sheep = 0.1<br>Goats = 0.1<br>Pigs = 0.2<br>Poultry = 0.01  | -             |
|                                | Farmer saves money (X7)                           | Farmer savings   | 1 = Yes<br>0 = No   | -             |
|                                | Farmer perception of loan repayment period (X8)   | Does the farmer perceive repayment period a constraint       | 1 = Yes<br>0 = No   | -             |
|                                | Farmers perception of lending procedures (X9)     | Does the farmer perceive the lending procedures a constraint | 1 = Yes<br>0 = No   | -             |
|                                | Opportunity to take a second loan (X10)           | Does the farmer have a second chance to take a loan          | 1 = Defaulter<br>0 = Otherwise  | -             |
|                                | Financial market Proximity (X11)                  | Dummy  | 1 = ≤ 5 Kilometres<br>0 = Otherwise   | -             |
|                                | Attitude towards Risk (X12)                       | Does the farmer fear the risk of taking a loan?              | 1 = Yes<br>0 = No   | +             |
|                                | Extension Contact (X13)                           | Does the farmer contact the extension for information        | 1 = Yes<br>0 = No   | +             |
|                                | Experience in credit Use (X14)                    | How long has been using credit                               | Number of years   | +             |
| Membership of the Farmer (X15) | Does the farmer belong to any farmer organization | 1 = Yes<br>0 = No  | +   |               |

## 4. Empirical Results and Discussion

This study investigates the factors influencing access to and the size of agricultural credit extended to smallholder farmers in Zimbabwe. Using data from 442 respondents, the analysis employs a double-hurdle model to examine both the decision to apply for credit and the loan amount obtained. The empirical findings, supported by cross-tabulation and regression models, provide insight into the financial landscape and credit accessibility within the agriculture sector.

### 4.1. Demographic analysis

Gender disparities are evident in agricultural credit access. The findings indicate that most households are male-headed, suggesting that financial decision-making power remains concentrated among men. Structural barriers such as land ownership restrictions, cultural norms, and financial literacy gaps hinder female farmers from accessing credit. Similar trends have been observed in Uganda (Bryan, Alvi, Huyer, & Ringler, 2024) and Ghana (Ahiawodzi & Sackey, 2013), reinforcing the need for gender-sensitive financial policies.

The age distribution of farmers shows that middle-aged individuals dominate the sector. Table 2 below illustrates the results from the analysis of findings. With an average age of 45.38, middle-aged people are more likely to access credit due to financial stability and accumulated farming experience. Older farmers are more likely to obtain loans, while younger farmers struggle due to a lack of collateral and credit history (Rahji & Fakayode, 2009). Inclusive financial strategies, such as subsidized loans for younger farmers and policy adjustments for older farmers, may enhance equity in credit access (Chandio, et al., 2021).

Table 2: Farmers' age analysis

| Measure            | Value (Age) |
|--------------------|-------------|
| Mean               | 45.38       |
| Median             | 44.50       |
| Standard Deviation | 12.73       |
| Minimum            | 23.50       |
| Maximum            | 75.00       |
| Range              | 51.00       |

### 4.2. Credit applications and Loan size

The study reveals that 72% of smallholder farmers did not apply for agricultural credit, highlighting significant barriers to financial inclusion. Limited awareness, high interest rates, and aversion to debt were the primary reasons for low participation. Similar patterns have been reported in rural Nigeria (Rahji & Fakayode, 2009) and Ghana (Ahiawodzi & Sackey, 2013), where repayment concerns and market volatility deter farmers from seeking credit. The analysis of loan amounts for farmers who accessed credit from formal sources is shown in Figure 2 below:

```

. summarize loan_amount

  Variable |      Obs   Mean   Std. Dev.   Min   Max
-----+-----
loan_amount |      169  457.95   175.12   107.70  808.19

. tabulate credit_access

credit_access |      Freq.   Percent   Cumulative
-----+-----
      0 |      276    62.02    62.02
      1 |      169    37.98   100.00
  Total |      445   100.00

```

Figure 2: Analysis of accessed loan amounts (\*\* All figures converted to USD).

Among farmers who accessed credit, the median loan size was USD 435.05, with an average of USD 457.95. The disparities in loan amounts suggest that farmers with greater resources or stronger financial networks secure larger loans while those with limited collateral remain constrained. Cross-country comparisons indicate that smallholder farmers in India (Ma, Rahut, Sonobe, & Gong, 2024) and Ethiopia (Gutema, 2021) receive higher loan amounts due to robust

government-backed credit systems. In contrast, Zimbabwe's economic instability and credit rationing policies contribute to the lower loan sizes.

#### 4.3. Interest rates and Collateral requirements

Interest rates play a crucial role in borrowing decisions, with 70% of respondents considering them important. High interest rates deter farmers from applying for loans, as observed in India (Ma, Rahut, Sonobe, & Gong, 2024) and Cameroon (Djournessi, Kamdem, Afari-sefa, & Bidogeza, 2018). Flexible lending policies and interest rate subsidies could alleviate financial burdens on smallholder farmers. Table 3 below analyzes farmers' perceptions regarding the significance of interest rates in accessing credit.

Table 3: Farmers' perception of interest rates in a credit application

|                    | Frequency | Percent | Valid Percent | Cumulative Percent |
|--------------------|-----------|---------|---------------|--------------------|
| Important          | 204       | 46.2    | 46.2          | 46.4               |
| Not important      | 27        | 6.1     | 6.1           | 52.5               |
| Somewhat important | 108       | 24.4    | 24.4          | 76.9               |
| Very important     | 102       | 23.1    | 23.1          | 100.0              |
| Total              | 442       | 100.0   | 100.0         |                    |

Collateral remains a significant barrier, with over 70% of farmers acknowledging its importance in securing loans. Formal land titles and assets are primary requirements, limiting access for resource-poor farmers (Kuipa, 2019). Similar constraints exist in Zambia, where savings groups provide alternative credit options without collateral requirements (Balana & Olanrewaju, 2024). Adopting innovative lending models, such as group guarantees and inventory financing, could improve credit accessibility. Table 4 below illustrates the farmer's perspective on collateral requirements.

Table 4: Farmers' perception of collateral requirements

|                    | Frequency | Percent | Valid Percent | Cumulative Percent |
|--------------------|-----------|---------|---------------|--------------------|
| Important          | 171       | 38.7    | 38.7          | 38.9               |
| Not important      | 55        | 12.4    | 12.4          | 51.4               |
| Somewhat important | 75        | 17.0    | 17.0          | 68.3               |
| Very important     | 140       | 31.7    | 31.7          | 100.0              |
| Total              | 442       | 100.0   | 100.0         |                    |

#### 4.4. Statistical assumptions and Model validity

The study performs tests for sampling adequacy, normality, and multicollinearity. The Kaiser-Meyer-Olkin (KMO) values range from 0.535 to 0.792 (Table 5), confirming sample adequacy. Bartlett's Test of Sphericity ( $p < 0.001$ ) supports the suitability of the dataset for factor analysis.

Table 5: KMO and Bartlett's test Results

| Scale                                      | Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | Bartlett's Test of Sphericity |     |      |
|--|--|-------------------------------|-----|------|
|  |  | Approx. Chi-Square            | Df  | Sig. |
| Agricultural credit access                 | .701   | 105.32                        | 441 | .000 |
| Age of the household Head                  | .585   | 74.437                        | 441 | .000 |
| Gender of household Head                   | .650   | 429.89                        | 441 | .000 |
| Level of education                         | .772   | 104.43                        | 441 | .000 |
| Family Labour Endowment                    | .613   | 93.353                        | 441 | .000 |
| Farm Size                                  | .535   | 69.431                        | 441 | .000 |
| Total Livestock Ownership                  | .653   | 421.89                        | 441 | .000 |
| Farmer saves money                         | .749   | 114.43                        | 441 | .000 |
| Farmer perception of loan repayment period | .633   | 78.893                        | 441 | .000 |
| Farmers perception of lending procedures   | .750   | 124.43                        | 441 | .000 |
| Opportunity to take a second loan          | .672   | 67.811                        | 441 | .000 |
| Financial market Proximity                 | .651   | 109.89                        | 441 | .000 |
| Attitude towards Risk                      | .794   | 111.43                        | 441 | .000 |
| Extension Contact                          | .658   | 99.893                        | 441 | .000 |
| Experience in credit Use                   | .792   | 104.43                        | 441 | .000 |
| Membership of the Farmer                   | .699   | 109.89                        | 441 | .000 |

Levene's test (Table 6) indicates normal distribution for key variables, and multicollinearity diagnostics (Table 7) reveal acceptable Variance Inflation Factor (VIF) values, ensuring model robustness (Mullahy & Norton, 2024).

Table 6: Levene's test Results

|   | Statistic | Df  | Sig. |
|---|-----------|-----|------|
| Age of the household Head (X1)                  | .699      | 441 | .223 |
| Gender of household Head (X2)                   | .728      | 441 | .744 |
| Level of education (X3)                         | .573      | 441 | .644 |
| Family Labour Endowment (X4)                    | .638      | 441 | .532 |
| Farm Size (X5)                                  | .747      | 441 | .615 |
| Total Livestock Ownership (X6)                  | .627      | 441 | .942 |
| Farmer saves money (X7)                         | .583      | 441 | .531 |
| Farmer perception of loan repayment period (X8) | .872      | 441 | .337 |
| Farmers' perception of lending procedures (X9)  | .699      | 441 | .528 |
| Opportunity to take a second loan (X10)         | .768      | 441 | .448 |
| Financial market Proximity (X11)                | .829      | 441 | .519 |
| Attitude towards Risk (X12)                     | .867      | 441 | .633 |
| Extension Contact (X13)                         | .712      | 441 | .531 |
| Experience in credit Use (X14)                  | .849      | 441 | .724 |
| Membership of the Farmer (X15)                  | .762      | 441 | .545 |
| Agricultural Credit Access (Y)                  | .785      | 441 | .414 |

Table 7: Collinearity Statistics

| Variables                                       | Tolerance | VIF   |
|---|-----------|-------|
| Age of the household Head (X1)                  | .748      | 1.361 |
| Gender of household Head (X2)                   | .394      | 5.186 |
| Level of education (X3)                         | .587      | 1.361 |
| Family Labour Endowment (X4)                    | .587      | 2.538 |
| Farm Size (X5)                                  | .820      | 1.704 |
| Total Livestock Ownership (X6)                  | .345      | 1.704 |
| Farmer saves money (X7)                         | .939      | 1.220 |
| Farmer perception of loan repayment period (X8) | .593      | 2.899 |
| Farmers' perception of lending procedures (X9)  | .543      | 1.065 |
| Opportunity to take a second loan (X10)         | .394      | 1.686 |
| Financial market Proximity (X11)                | .923      | 1.842 |
| Attitude towards Risk (X12)                     | 0.839     | 1.192 |
| Extension Contact (X13)                         | 0.784     | 1.276 |
| Experience in credit Use (X14)                  | 0.694     | 1.441 |
| Membership of the Farmer (X15)                  | 0.723     | 1.383 |
| Agricultural Credit Access (Y)                  | 0.652     | 1.534 |

#### 4.5. Chi-Square Test: Gender and Credit access

A chi-square test assesses the relationship between gender and credit access. Although male-headed households receive more loans, statistical analysis ( $p = 0.976$ ) suggests that gender alone does not significantly influence credit access. Similar findings by (Gutema, 2021) indicate that economic conditions and asset ownership play a more substantial role than gender biases in financial institutions. However, targeted interventions addressing women's access to productive resources remain necessary. The results are illustrated in the tables below:

Table 8: Crosstabulation

| Count   |                                | What is the gender of your household head? |      | Total |
|---|--------------------------------|--|------|-------|
|   |                                | Female                                     | Male |       |
| If you applied, what were the results of the last application for the loan? | 1                              | 58   | 258  | 317   |
|   | Approved, but a lower amount   | 0  | 4    | 28    |
|   | Happy with the approved amount | 0  | 7    | 56    |
|   | Loan application denied        | 0  | 7    | 39    |
|   | Other (specify                 | 0  | 0    | 2     |
| Total   | 1                              | 76   | 365  | 442   |

Table 1: Chi-square test- Gender vs. Agricultural credit access

|                    | Value              | df | Asymp. Sig. (2-sided) |
|--------------------|--------------------|----|-----------------------|
| Pearson Chi-Square | 2.157 <sup>a</sup> | 8  | .976                  |
| Likelihood Ratio   | 2.843              | 8  | .944                  |
| N of Valid Cases   | 442                |    |                       |

a. 8 cells (53.3%) have an expected count of less than 5. The minimum expected count is .00.

#### 4.6. Determinants of Agricultural credit access and Loan size

The Probit regression model identifies key determinants of credit application. Middle-aged and older farmers exhibit a higher probability of applying for credit ( $p = 0.019$  and  $p = 0.002$ , respectively), aligning with findings from (Ma, Rahut, Sonobe, & Gong, 2024) that suggest financial experience enhances credit access. Farm size positively correlates with credit application ( $p = 0.004$ ), reinforcing that larger landholdings provide greater collateral security (Balana & Olanrewaju, 2024). Education presents mixed effects, with secondary education negatively associated with credit application ( $p = 0.015$ ), suggesting that highly educated farmers may seek alternative financing sources (Ahiawodzi & Sackey, 2013); (Chandio, et al., 2021). Table 10 shows the probit regression analysis outcomes.

Table 10: Probit Regression Results

| Variable              | Coefficient | Std. Error | P-Value |
|-----------------------|-------------|------------|---------|
| Age (Middle-aged)     | 0.124       | 0.052      | 0.019   |
| Age (Older)           | 0.198       | 0.058      | 0.002   |
| Education (Primary)   | -0.086      | 0.049      | 0.075   |
| Education (Secondary) | -0.134      | 0.056      | 0.015   |
| Farm Size             | 0.321       | 0.112      | 0.004   |
| Savings Groups        | 0.089       | 0.037      | 0.021   |

The Tobit regression model reveals that farm size significantly influences loan amounts ( $p = 0.002$ ). Larger farms attract more substantial credit due to their productive potential (Okonta, Odemero, Achoja, & Okuma, 2023); (Sehgal, 2024). Membership in savings groups also enhances loan sizes ( $p = 0.003$ ), as collective guarantees reduce perceived lending risks (Ninsiima, Bulyaba, & Makosa, 2023). However, age and education have minimal direct effects on loan amounts, suggesting that lenders prioritize economic stability and collateral over demographic characteristics. Table 11 shows the outcomes of the Tobit regression analysis.

Table 11: Tobit Regression Results

| Variable              | Coefficient | Std. Error | P-Value |
|-----------------------|-------------|------------|---------|
| Age (Middle-aged)     | -0.045      | 0.034      | 0.198   |
| Age (Older)           | -0.067      | 0.039      | 0.094   |
| Education (Primary)   | -0.023      | 0.028      | 0.417   |
| Education (Secondary) | -0.045      | 0.031      | 0.152   |
| Farm Size             | 0.278       | 0.088      | 0.002   |
| Savings Groups        | 0.142       | 0.046      | 0.003   |

#### 4.7. Future research directions

Future studies should incorporate qualitative assessments of trust in financial institutions, risk perceptions, and social capital dynamics. Understanding these unobserved factors will provide deeper insights into the barriers and facilitators of agricultural credit access. Additionally, examining the impact of digital financial services and alternative credit models could inform policy strategies to enhance financial inclusion for smallholder farmers in Zimbabwe.

## 5. Conclusion and Recommendations

This study analyzes the key determinants of the accessibility and availability of agricultural credit to smallholder farmers in Zimbabwe. The empirical findings confirm the intricate intertwinement of socioeconomic, institutional, and environmental factors that influence the credit situation for this vital segment of the farming population.

The findings show that, as much as agriculture is a critical sector of the national economy and food security, structural challenges limit farmers' ability to access finance. The role of savings groups is especially significant, as these organizations provide social capital and trust-building mechanisms that facilitate access to credit. This underscores the need for financial institutions to integrate group lending models into their credit products, particularly for farmers in rural and marginalized areas.

Farm size emerges as a key driver of access to credit, with bigger farms having a higher chance of obtaining finance because

of the preference for asset-based lending. This trend puts smaller-scale farmers at a disadvantage, and there is a need for financial policies that favour farmers with limited resources. Credit guarantees and flexible collateral requirements must be implemented to enable easier access to loans for those who do not have large tracts of land. Institutional factors are particularly challenging, as risk perception and collateral requirements restrict access to formal financial markets. The use of traditional collateral, e.g., land title ownership, leaves out a majority of smallholder farmers who do not have formal proof of ownership. Alternative mechanisms, like movable asset registries and warehouse receipt systems, need to be introduced to enhance security for the lenders while widening credit access.

High costs of transactions, together with low repayment levels, further restrict the amount of credit extended to agriculture producers since the financial institutions treat smallholder agriculture as a high-risk enterprise. Implementing risk management products such as weather-indexed insurance and government-backed guarantee programs would increase lending to the sector. This would mitigate the perceived risk and encourage banks to advance more significant loan amounts to smallholder farmers. The research further highlights gender inequalities in access to credit, where female farmers have extra challenges emanating from sociocultural values and restricted access to productive resources. To tackle such disparities, there is a need to adopt gender-sensitive credit initiatives, including lower collateral needs and specialized mentorship programs aimed at enhancing financial literacy and economic empowerment.

Poor rural banking infrastructure and underdeveloped digital financial services limit credit availability, particularly in rural and remote regions. Expanding digital financial services such as mobile banking and internet-based credit platforms and investing in rural digital infrastructure would greatly enhance financial inclusion. Institutional reform to improve transparency, address land tenure problems, and coordinate policy is vital to building trust in the financial system. Public-private partnerships can strengthen institutional support and help create a more sustainable agriculture financing system.

Though the study offers valuable insights, it recognizes the impact of unquantifiable factors on credit relations, including confidence in financial institutions, risk perceptions, and prevailing social norms. Future studies need to incorporate such qualitative factors to give a fuller picture of the issues involved in credit availability. By adopting these specific interventions, Zimbabwe can establish a more inclusive and sustainable agricultural credit system that enhances productivity, spurs rural development, and builds economic resilience.

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The authors declare that they have no conflicting interests

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### **Ethical considerations**

The article followed all ethical standards appropriate for this kind of research.

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## **References**

- AfDB. (2024). COUNTRY FOCUS REPORT 2024 ZIMBABWE Driving Zimbabwe's Transformation The Reform of the Global Financial Architecture. Abidjan: African Development Bank (AfDB).
- Ahiawodzi, A. K., & Sackey, F. G. (2013). Determinants of Credit Rationing to Private Sector in Ghana. *African Journal of Business Studies* 7(38), 3864-3874.
- Balana, B., & Olanrewaju, O. (2024). Financial Inclusion, Agricultural Inputs Use, and Household Food Security. International Food Policy Research Institute (IFPRI), a CGIAR Research Center; IFPRI Discussion Paper 02293.
- Bryan, E., Alvi, M., Huyer, S., & Ringler, C. (2024). Addressing gender inequalities and strengthening women's agency to create more climate-resilient and sustainable food systems. Elsevier, *Global Food Security*, Vol 40.
- Chandio, A. A., Jiang, Y., Rehman, A., Twumasi, M. A., Pathan, A. G., & Mohsin, M. (2021). Determinants of demand for credit by smallholder farmers: A farm level analysis based on a survey in Sindh, Pakistan. *Journal of Asian Business and Economic Studies*, Volume 23, Issue 3, 225-240.
- Dawes, M., & Mushongachware, R. (2024). Financial services and financing mechanisms for ensuring the development of identified Sasso poultry and sorghum business models in the Murewa and Mbire districts in Zimbabwe. Harare: Department of Agricultural Advisory and Rural Development Services (AARDS).
- Djoumessi, Y. F., Kamdem, C. B., Afari-sefa, V., & Bidogez, J.-C. (2018). Determinants of Smallholder Vegetable Farmers Credit Access and Demand in Southwest region, Cameroon. *Economics Bulletin* Volume, 38 Issue 2, 1231-1240.
- FAO. (2024, July 18). Zimbabwe at a glance. Retrieved from FAO in Zimbabwe (Food and Agriculture Organisation of

- the United Nations): <https://www.fao.org/zimbabwe/fao-in-zimbabwe/zimbabwe-at-a-glance/en/>
- Gutema, A. A. (2021). *Microfinance for Smallholder Farmers: The Lived Experience of Borrowers in Akaki, Ethiopia*. Walden Dissertations and Doctoral Studies.
- Haryanto, T., Wardana, W. W., Jamil, I. R., Brintanti, A. R., & Ibrahim, K. H. (2023). Impact of credit access on farm performance: Does source of credit matter? *Heliyon* 9(24): e19720, 2-13.
- Kamau, C. N., Majiwa, E. B., Otieno, G. O., & Kabuage, L. W. (2024). A double-hurdle model estimation of adoption and intensity of use of poultry production technologies in Machakos County, Kenya. Taylor & Francis Online Article: 2338435 <https://doi.org/10.1080/23311932.2024.2338435>.
- Kuipa, P. J. (2019). *THE AGRICULTURAL FINANCING GAP IN ZIMBABWE: RATIONING, SUSTAINABLE CREDIT ACCESS AND PARTICIPATION IN RURAL FINANCIAL MARKETS*. Bloemfontein: Centre for Sustainable Agriculture, Rural Development and Extension, Faculty of Natural and Agricultural Sciences, University of the Free State.
- Ma, W., Rahut, D. B., Sonobe, T., & Gong, B. (2024). Linking farmers to markets: Barriers, solutions, and policy options. *Economic Analysis and Policy*, Vol 82, 1102-1112.
- Mafirakurewa, T. M. (2023). . Factors Influencing Smallholder Farmers' Decisions to Participate in Loan-Based Farming in Mutare District, Zimbabwe—. (13(12), 2225 ed.). *A Double-Hurdle Model Approach*. Agriculture.
- Mullahy, J., & Norton, E. C. (2024). Why Transform Y? The Pitfalls of Transformed Regressions with a Mass at Zero. *Wiley Online Library*, Volume 86, Issue 2, 417- 447.
- Ninsiima, R., Bulyaba, R., & Makosa, D. (2023). DETERMINANTS OF PARTICIPATION IN AGRICULTURAL GROUP GUARANTEE LOANS: A CASE OF SMALLHOLDER FARMERS IN EASTERN UGANDA. *African Journal of Food, Agriculture, Nutrition and Development* Volume 23 No.4, 39-60.
- Odhiambo, B. O., Gathungu, E., & Opondo, F. (2023). Determinants of Credit Access and Amount of Credit by Youth in Rachuonyo North Sub-County. *Open Access Library Journal*, 10, doi: 10.4236/oalib.1110323., 1-15.
- Okonta, N. P., Odemero, F., Achoja, & Okuma, L. (2023). Willingness and capacity of borrowers for loan repayment among farmers in Delta State Nigeria. *GSC Advanced Research and Reviews* 17(02), 112-125.
- Rahji, M., & Fakayode, S. (2009). A multinomial logit analysis of agricultural credit rationing by commercial banks in Nigeria. *International Research Journal of Finance and Economics*, Vol. 24, 97-103.
- RBZ. (2025). 2025 Monetary Policy Statement. Harare: Reserve Bank of Zimbabwe Act [Chapter 22:15], Section 46.
- Reyes, M. D., Shumway, S. B., & Tong, C. S. (2023). Impact of Access to Agricultural Credit on Agricultural Productivity in Iowa, USA. *Stratford Peer Reviewed Journals and Book Publishing, Journal of Agriculture* Volume 7, Issue 1, 1-11.
- Sehgal, V. (2024). Determinants of rural credit in India: evidence from a large-scale sample survey. *International Journal of Social Economics*.
- Sorzano, C. O. (2022). *Introduction to sample size calculations*. Madrid: National Center of Biotechnology (CSIC), [coss@cnb.csic.es](mailto:coss@cnb.csic.es).
- Touch, V., Tan, D. K., Cook, B. R., Liu, D. L., Cross, R., Tran, T. A., . . . Cowie, A. (2024). Smallholder farmers' challenges and opportunities: Implications for agricultural production, environment and food security. *Journal of Environmental Management*, Volume 370, November 2024, 122536.
- World Bank. (2024, March 15). *Agriculture and Food*. Retrieved from The World Bank: <https://www.worldbank.org/en/topic/agriculture/overview>