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DEPARTMENT OF ACCOUNTING AND FINANCE

DETERMINANTS OF ACCESS TO FORMAL CREDIT FOR SMALL

LAND HOLDER FARMERS: THE CASE OF DEBREBRHAN ZURIA WOREDA

BY: YOSEF EDEGIE FENTEW

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A STUDIES SUBMITTING IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MBA IN ACCOUNTING AND FINANCE

ADVISOR: MOHAMMED SEID (Ass.prof)

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ABBREVIATIONS AND ACRONYMS

ACSI : Amhara Credit and Saving Institution

AIDB : Agricultural and Industrial Development Bank

ANRS : Amhara National and Regional State

BoA : Bureau of Agriculture

DAG : Development Assistance Group

DBE : Development Bank of Ethiopia

FMSC : Farmers Multi-Purpose Service Cooperatives

GDP : Gross Domestic Product

MFI : Micro Finance Institution

NBE : National Bank of Ethiopia

NGO : Non-Governmental Organization

NAROD : Norwegian Agency for Development Cooperation

NSZOA : Debrebrhan Zaria Woreda Office of Agriculture

ORDA : Organization for Rehabilitation and Development in Amhara

PA : Peasant Association

RSCA : Rotating, Saving and Credit Association

UNDP : United Nation Development Program

DECLARATION

This was to certify that the thesis entitled ―*Determinants of Access to Formal Credit for Small Landholder Farmers: The Case of Debrebrhan Zuria Woreda"* submitted in partial fulfillment of the requirements for the degree of MBA in Accounting and Finance Department of Accounting and Finance, ST Marry University was a record of original work carried out by me in line with the regulations of the university and meets an accepted standards with respect to originality and quality.

Yosef Edegie Fentew	**16/07/2022**	
Name of the candidate	**Date**	**Sign**

St. marry university, Addis Ababa

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St marry university, Addis Ababa

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ST MARRY UNIVERSITY

SCHOOL OF GRADUATE STUDIES

FACAULITY OF BUSINESS

As members of the board of examiners, we examined this thesis entitled ―*DETERMINANTS OF ACCESS TO FORMAL CREDIT FOR SMALL LAND HOLDER FARMERS: THE CASE OF DEBREBRHAN ZURIA WOREDA"* **BY YOSEF EDEGIE FENTEW**. We hereby certify that the thesis was accepted for fulfilling the requirements for the award of the degree MBA in Accounting and Finance.

APPROVED BY: BOARD OF EXAMINERS

External examiner name	*Signature*	*Date*
Andinet Asmelash (Ass.Prof)	_____	_____
Internal examiner name	*Signature*	*Date*
Asmamaw Getie (Ass.pro)	_____	_____
Dean, Graduate studies	*Signature*	*Date*
_____	_____	_____

Advisor's name	*Signature*	*Date*
Mohammed Seid (Ass.Prof)	_____	_____

St marry university, Addis Ababa

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ENDORESMENT

This thesis has been submitted to St marry university school of graduate studies for examination with my approval as a university advisor.

<u>**Advisors   Name**</u>   <u>**signature**</u>

Mohammed Seid (Ass.Pro)

St marry university, Addis Ababa

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Acknowledgment

ABSTRACT

This study tried to identify the effect of demographic, socio-economic, and institutional factors on access to formal credit in Debrebrhan Zuria Woreda. To achieve this objective, the study utilized a cross-sectional survey research design. Primary data was collected using a self-designed questionnaire from 360 Debrebrhan Zuria woreda household farmers who were selected by multi-stage sampling. A binary Logistic regression model was used to analyze the mixed data using SPSS version 20. In addition, the interview was conducted with selected ACSI officers to support the data collected by questionnaire. The result of the study revealed that 48 % of the respondents in the study area had access to formal credit while 53 % of the respondents did not have the access to formal credit. It also found that variables like a collateral requirement, saving culture of households, source of information, number of livestock units, experience in credit use, and deposit interest rate were important in influencing access to formal credit use as evidenced by the model output. Hence, the researcher suggests that CBE and microfinance institutions should encourage farmers saving culture by strengthening deposit interest rates. MFWARE should promote themselves and the type of services they will provide over different local media and mass media such as radio, television,n, and newspapers so, that the rural poor will had an improved farmer's access to evidence. In the case of collateral, the researcher recommended that the household heads or the respondents form a group to collect loans or credit from banks and microfinance. In case of a source of information, iwasre available that Small landholder farmers need to find new information about not only financial institutions but also everything related to their country.

Key words: Access to Formal Credit, Small Landholders, peasant association, logit regression

CHAPTER - ONE

INTRODUCTION

Formal credit were one source of finance for farmers to finance their factors of production. Small landholders may not be able to have the access to formal credit due to their inability to fulfill the requirements requesting by lending institutions. This study tries to identify the factors that affect access to formal credit for small landholder farmers in Debrebrhan zuria woreda.

This Studies Consists of the background of the study, statement of problem, objectives, Significance and delimitation/scope of the study, hypothesis, and definition of terms.

1.1. Background of the Study

Access to credit were very critical for small landholder farmer's growth in industrializing Countries of the world. This were because of total production of farmers and enhancement in agricultural production per unit input (Chandio et al., 2017). According to online dictionary (n.d), credit leads to an increase in spending, thus increasing income levels in the economy.

This, in turn, leads to higher GDP (gross domestic product) and thereby faster productivity growth. If credit were uses to purchase productive resources, it helps in economic growth and adding to income. Credit further leads to the creation of debt cycles. Additionally, credit were needs for farming purposes and as a bridging finance for family and consumption expenses especially between the planting and harvest periods. Thus, lack of access to formal credit by farmers negatively affects productivity. In Ethiopia, agricultural sector contributing over 85 % of e export earning, 44 percent of total Gross Domestic Product (GDP) and provides a livelihood to almost 73 percent of the population .In addition, agricultural sector supports about 85% of the population that were completely dependent on agricultural relating livelihoods, most of whom were poor people in the rural countryside. Therefore, agriculture were the fundamental stay of the economy.

Even though farmers produce the majority of national agricultural production, agriculture were not capable to feeding the fast growing population and diminish the dependence of food aid. And it were characterizing by small-scale Subsistence farmers with average land holding of 2.0 hectare per farm landholdings, until now by using backward farming system which ultimately results in

low productivity .The low level of productivity and lack of ability of agricultural output to improve the livelihoods of the rural poor were as a result of several factors.

These includes limiting access to formal credit, poor infrastructure, small land holding (Ogato et al., 2010) and the nature of land tenure systems (Devereux, 2000). Provision of access to formal credit were one of the major instruments using to reducing poverty and encourage rural entrepreneurship. Increasing accesses to formal credit holds the promise in reducing poverty and improve development outcomes by enabling the poor to smooth consumption and by increasing or diversify landholdings income. Microcredit were establishing to benefit poor landholdings who had not collateral and various requirements necessary to gain access to formal credit (Bauchet et al., 2011). Access to formal credit can significantly increase the ability of landholdings to meet their financial needs like acquisition and use of better agricultural implements, which were not accessible on the farm. Additionally, access to formal credit encourages landholdings' ability to adopt modern agricultural technologies that increase the revenue of small landholder farmers and discontinuity of the vicious poverty cycle.

The rural financial systems in Ethiopia were dichotomous in nature. As a result, formal and informal sector co-exists, with the differences in their availability. Formal financial institutions were organizations, which owns, controlling, licensing and registering by Governments. Informal credit institutions work without physical guarantee, involving small loans and short-term transaction (Yehuala, 2008).

The major difference among formal and informal sector were that the informal sector works without rules and regulations. When formal credit institutions were existing, informal borrowing reducing but eliminates (Singh, 1993). The two forms of credit sources were achieving different purposes for landholdings' transfer of resources. Generally, financial sources in Ethiopia consist of commercial banks, insurance companies, microfinance institutions, multipurpose cooperatives and money lends.

There were different microfinance institutions that were establishing and operating in order to solve the credit access problem of the poor farm landholdings in Amhara region (Befekadu, 2007). This were because of an increase in farmers request for credit and an increase in population number from time to time. Now a day's credit clients and individual voluntary savers were increasing in Amhara region. The entire resolution of accessing agricultural credit for small landholder farmers would be to enable operational and capital investment where farmers get credit to buy seeds,

fertilizer and other equipment during the planting season. It plays a basic role in covering consumption insufficiencies of farm landholdings and using as income transfer instrument to eradicate the imbalances in income distribution among the small, middle, and big farmers. Generally, there were resolving issues as far as small landholder farmers were concerning which were the problem facing by those farmers in obtaining formal credit from banks and microfinance institutions. For example, individual characteristics and institutional characteristics had mixing impact on accessibility of formal credit and the result were varying across countries (Ahming, 2016).

Different studies had conducting in different countries by different researchers regarding the factors that affect access to formal credit. (i.e. (Yehuala, 2008, (Befekadu, 2007). The studies of Befekadu, 2007) studies were conducting in Amhara region relating with the factors that affect access to formal credit on small landholder farmers. The study indicating that access to formal credit had a positive effect on small landholder farmers 'productivity, but access to formal credit were still low in Amhara region.

1.2. Statement of the Problem

Credit progressively knows to be influential mechanism to lift rural poor out of miserable poverty. Credit plays a vital role in expanding farming productivity through rising up the production assets (Chareasa, 2019).It also allows small landholder farmers to capitalize their land improvements and thereby to approve new agricultural expertise's like high-yielding seeds and fertilizers that raised their productivity and income (Zeller& Sharma2000). Then Credit expands the well-being of the rural poor over financing consumption and dropping the opportunity cost of highly valuing assets and adopting labor saving technologies. Furthermore, it were important to insure the rural poor against the vulnerability of shocks (flood, drought and others) by reducing the cost of the farmer to cope up with those shocks. Generally, Credit were critical to attain rapid and sustainable development.

Unavailability of formal credit access limits the rural small landholder farmers their ability to expand productivity and thereby improve their living standard. Formal credit institutions like traditional commercial banks and development banks were not volunteer in delivering financial services to the rural poor farmers (Diagne, 1999). Those institutions were able to spread the credit access to a limiting business only. If they provide, they needs different types of requirements from

poor farmers such as collateral (Jeanes, 2002). To address these difficulties, the Ethiopian government recognizing microfinance institutions (MFIS) to reach a majority of rural poor. According to Bizuayehu et al., 2019), microfinance institutions had no clear rule and regulation with regard to formal credit access to the poorest of the poor showing that MFIS were not working their main task of reaching the poor.

In short, the main concern of this study were the overall aspect of credit access in DEBREBRHAN Zuria Woreda. The problem of the study were stands from the identifying limiting or inadequate access to formal credit for small landholder farmers.

A considerable empirical investigation makes outside Ethiopia on the determinants of access to formal credit; some of them were (Oboh & Kushwaha, 2015; Mohieldin & Wright, 2000; Dzadze et al. 2012; Baiyegunhi & Fraser, 2014). However, their finding lack consistency; for instance, studies conducting by (Kiplimo et al., 2015; Ibrahim & Aliero, 2012; Chivandire & Muhongayire, 2019) indicate that access to formal credit for farmers raised when there an increase in age and education. Similarly, studies by (Dzadze et al., & Duy et al. 2012; Sebatta et al., 2014) also showing that access to formal credit were determining by saving account, extension contact, distance to lending institution and education level of landholdings. In addition, the study by (chareasa, 2019) showing that access to formal credit were not determining by education level of landholdings.

In Ethiopia, prior researchers mainly focusing on analysis of determinants of access to credit

among smallholder farmers, they didn't give attention to small landholder farmer's microfinance credit access. As per the researcher understanding, from the overall local researcher few researchers (Ayele & Goshu, 2018; kiros, 2012) in Ethiopia had done studies which were using descriptive research design (Muse, 2016; Samuel, 2020; Yehuala, 2008), all the studies conducting out of North Shewa. The study by muse (2016) analyzes the determinants of landholdings level access to formal finance in Sidama zone; the study by Samuel (2020) assuming in wolaita zone; the study by Yehuala (2008) assesses determinants of access to formal credit in North Shewa. Those studies were using descriptive research design and do not include all-important variable that affect access to formal credit. In addition, most of the literatures were inconsistency in their findings. This study seeks to fill the gap by adding new variables that affect small landholder farmers 'access to formal credit in Debrebrhan   Zuria woreda. Therefore, the researcher including

some variables besides the studying determinants like, saving culture of farmers in formal credit institutions by small landholder farmers and amount of interest rates charging by formal credit institutions. Finally, the overall purpose of This study were conducting to explore the determinants that affect small landholder farmers 'access to formal credit in Debrebrhan Zuria woreda and it gives solution for the problems to improving access to formal credit.

1.3. Basic research questions

This study were intending to deals with the following research questions:

1) What were the demographic characteristics of farmers that affect access to formal credit for small landholder farmers in Debrebrhan Zuria worda?

2) What were the socio-economic characteristics of borrowers that affect access to formal credit for small landholder farmers in Debrebrhan Zuria worda?

3) What were institutional characteristics of lending were that affect access to formal credit in Debrebrhan Zuria worda?

1.4. Objectives of the Study

The general objective of the study were to assess the factors affecting access to formal credit of small landholder farmer's in the case of Debrebrhan Zuria Woreda.

Specifically, this study tries to achieve the following objectives:

1. To identify the effects of demographic characteristics of farmers on access to formal credit of small landholder farmer's in Debrebrhan Zuria woreda

2. To identify the effects of socio- economic characteristics of farmers on access to formal credit of small landholder farmer's in Debrebrhan Zuria woreda

3. To identify the effect of institutional characteristics of lending were on access to formal credit for small landholder farmers in Debrebrhan Zuria woreda

1.5. Research Hypothesis

Basing on objectives of the study, the researcher were hypothesizing the following factors to evaluate their impacts on the access to formal credit.

H1. The age of landholdings, had positive significant impact on access to formal credit

H2. Gender of the landholdings had positive significant impact on access to formal credit

H3. Levels of education had positive impact on farmer's access to formal credit.

H4. Collateral had a significant positive impact on access to formal credit for small landholder farmers.

H5. Farm size in hectare had positive significance different between farmers in accessing formal credit.

H6. There were significance influence of saving culture on access to formal credit for small landholder farmers.

H7. Information had a significant and positive impact on access to formal credit.

H8. Livestock had a significant negative impact on access to formal credit for small landholder farmers.

H9. Experience in credit use had a significant positive influence on access to formal credit for small landholder farmers.

H10. Distance from lending institutions had no significant influence on access to formal credit for small landholder farmers.

H11. Infrastructure had positive significant impact on access to formal credit for small landholder farmers.

H12. The lending procedure of financial institutions had no significant impact on access to formal credit for small landholder farmers.

H13. Deposit interest rate had a significant and positive impact on access to formal credit for small landholder farmers.

1.6. Significance of the Study

The study conducting on factors that affect small landholder farmers 'access to formal credit in Debrebrhan Zuria woreda. Therefore, the study will had the following contributions:

It will provide useful information on the status of smallholder farmers in access agricultural credit from formal credit institutions). The study results will also benefit the development partners and civil society organizations involving in the provision of agricultural credit facilities to smallholder farmers and in improving the lending procedures in order to provide better services to their client.

It also severe as an input for further researchers by providing empirical evidence about access to formal credit to small landholder farmers. In addition to that, it helps the researcher to employ theoretical knowledge in to practice.

1.7. Scope of the Study

The study were delimiting to the factors that affect access to formal credit of small landholder farmers'. Geographically the study covers only small landholder farmers under the region of DEBREBRHAN Zaria Woreda, in Amhara National Regional State (ANRS). The sample size of the study were focusing on three selecting kebeles; those were **Ensaro, Hagere Maryam and minjar she kora**. The Study covers access to Amhara Credit and Saving Institution and commercial bank of Ethiopia. Because those were the main credit providers for farmers in Ethiopia and their branches were expanding all over, the area and small landholder farmers were using those institutions.

1.8. Limitation Of the study

This study were limited to determinants of access to formal credit with socio-economic and institutional variables and did not include macro- economic variables like inflation and gross domestic product in Ethiopian context. It would be expected that access to credit be extremely affected by those variable.

1.9. Organization of the Paper

This thesis were organizing in five parts. The first part presents an introduction about the study. It includes background of the study, statement of the problem, objective of the study, hypothesis of the study, significance of the study, and scope of the study. The second part describes about review of relating literature. It mainly contains two parts-the theoretical literature and empirical literature review. Third part were about research methodology. It contains its approach, design, model specification of the study. The fourth part focusing on data presentation, analysis. Finally, part five incorporating conclusion relevant evidence

CHAPTER -TWO

LITERATURE REVIEW

INTRODUCTION

This part incorporating two important sections. The first one were theoretical review and the other were Empherical review.

2.1. An Overview of Access to Formal Credit

Credit can be defined as the control over money and materials used in the exchange of goods and services and it is a promise to repay at a future date (Lawal et al., 2009).

Access to credit means that where loans for farmers are open and farmers have taken the initiative to apply and utilize these loans. Credit can be available yet not accessible because of restrictions such as costs and strict qualification criteria. Credit touches on the performance of agriculture by providing resources for the purchase of inputs and the adoption of new technology (Amjad & Hasnu, 2013).

Access to formal credit refers to the ability of individuals to gain external money to allow them to ease cash flow problems (Catherine, 2016). It is the most essential means that enables the farmers to increase their tasks or accept new technologies (Dzadze et al., 2012).

A credit business has been crucial to the economic growth of the modern world. Credit situates to use of property that would otherwise lie idle, consequently allowing a country to more fully employ its resources. The existence of credit institutions breaks the willingness of people to the sureness of one another and the court of law to enforce business contracts. Transfer property from those who have money to those who do not but who wish to use it, as in the granting of loans by banks to individuals who plan to initiate a business venture is the major purpose of credit (Yehaula, 2008)

2.1.1. The concept of small landholder farmers

Small landholder farmers are classified as subsistence farmers and semi-commercial farmers. A subsistence farmer includes the collection of major rural populations, who are still poor. Nevertheless, they try to earn a significant part of their livelihood from farming activities. In addition, their cultivation system is primarily based on traditional technology. Semi-commercial farmer includes the minority of the rural population. However, those populations are the most promising targeted group of small landholder farmers (Christina, 2017a).

According to Christina (2017), ―small landholders‖ refer to small landholder farmers who haven‗t the right to manage their farmland. There are many characteristics of small landholders, notwithstanding whether they control the land they cultivate or the products they harvest; they harvest generally little produce on moderately little pieces of land. They can grow commodities for export as their leading source of income or as a share of investment in subsistence income-making activities.

2.1.2. Theory of access credit

Stiglitz and Weiss (1981) postulated the credit theory; they provided a framework for analyzing financial market inefficiencies. This framework provides that information asymmetry is the main cause of financial market malfunctioning in developing countries. Financial institutions that advance loans to economic agents are not only interested in the interest they receive on loans, but also in the risks of such loans. Most financial institutions screen and monitor borrowers more efficiently than other investors can. They are specialized in gathering private information and treating it. Managing money and deposit accounts, banks own highly strategic information on firms' receipts and expenditures as well as the ―way that firms develop (Kashyap, Stein & Wilcox, 1993).

About Stiglitz and Weiss (1981) adverse selection and thus credit rationing still occurs if banks require collateral. They argue that low-risk borrowers expect a lower rate of return on average. Thus, they are less wealthy than high-risk borrowers on average after some periods. Low-risk borrowers are therefore not able to provide more collateral. Increasing collateral requirements may have the same adverse selection effect as a higher interest rate. Walsh (1998) argues that banks only offer contracts in which they simultaneously adjust interest rates and collateral requirements. He proved that there is always a combination of interest rate and collateral requirements so that credit rationing does not occur (Jaffa & Russell, 1996).

The proponents of this theory argue that the most interesting form of credit rationing is equilibrium rationing, where the market has fully adjusted to the public whereby banks ration credit free, available information and where demand for loans for a certain market interest rate is greater than supply. Stiglitz and Weiss (1981) explain that credit rationing occurs if a financial institution charges the same interest rate to all borrowers because they cannot distinguish between borrowers and screening borrowers perfectly is too expensive. Both assumptions are very simplifying and do not occur in this manner in the real world. Banks are usually able to distinguish their borrowers up to a certain degree.

2.1.3. Basic principles of credit

According to World Bank (2018), there are five types of credit principles (five Cs).

Principle of character: is the first C more specifically refers to credit history, a borrower's status or record of accomplishment for repaying debts. This information appears on the borrower's credit report.

Principle of capacity: it measures the borrower's ability to repay their credit by comparing income against recurring debt and assessing the borrower's debt-to-income ratio.

Principle of capital: Lenders are considering any capital the borrower puts toward a potential investment.

Principle of collateral: It is important for the borrowers as a secure loan and it gives the lender assurance when the borrower defaults on the loan, the lender can get something back by repossessing the collateral.

Principle of condition: It refers to how a borrower intends to use the money. Condition of loan such as interest rate, amount of principal and influence the lender desire to finance the borrower

2.1.4. Credit in rural development

Agricultural credit is the short-term inputs moved to a willing borrower for agricultural purposes, with the borrower's potential willingness and promise to repay in particular for after use and the confidence by the lender that the borrower will comply with terms, utilization, and recompense with, or without monitoring (Jan & Khan, 2012). They also defined agricultural credit as financial support that a farmer can get to link the gap between his/her income and expenditure in the field and noted that it is a basic technique in the development plan of the agricultural segment. In short, credit is a sum of money in favor of the person who has control over it, and who undertakes to pay it back. As Yehuala (2008) cited in his thesis, Kebede (1995) Credit is important for traditional agriculture more productive through the purchase of farm tools, other farm tools, and introduction to modern agricultural technology.it was also used as an instrument for market stability.

According to Dzadze et al., (2012) at a certain period of agricultural improvement agricultural credit does become a strong force for additional enhancement. Provision of credit is an important aspect of local development because it helps to achieve sustainable growth of agriculture. Local credit enables farmers to afford expensive agricultural technology which boosts agricultural production (Poliquit, 2006).

2.1.5. Types of rural credit

There are two types of rural credit in unindustrialized countries. They are formal and informal credit. Formal credit institutions are works together with an intermediary between depositors and lenders by charging relatively low-interest rates. According to Dejene (1993), the credit interest rate is 7% for individual farmers and private enterprises and 6% for state and collective farms (NBE Credit Regulation NBC/CR 1). The greatest agricultural finances of the AIDB (89%) go to state farms, which account for not more than 5% of the total agricultural output, whereas the private peasant sector receives an unimportant amount of loans (less than 1%). In informal agricultural credit, the cash is given by private persons, professional moneylenders, landlords, friends and relatives, traders, and commission agents (Mohieldin & Wright, 2000).

When formal credit institutions exist, informal borrowing reduces but eliminate. This indicated that formal and informal sources are achieving different purposes for the household's transfer of resources. Formal and informal credit is mutably not interchangeable as a result; formal credit is required and mostly used for agricultural production purposes and investment in extra–farm revenue-creating actions however informal credit may be important for consumption-smoothing purposes (Atieno, 2001).

The practical indication also advises that the imperfect substitutability among formal and informal credit redirects to some extent the presence of due dates and conditionally on informal loan contracts (Diagne, 1999).

According to Dejene (1993), informal credit markets are appropriate only for sectors that were indirectly productive and through which the expenses for social duties were met. In addition to this informal credit, markets are not homogeneous and they are a part of the dominant political, social, and economic networks, including low transaction costs for credit supply.

Generally, there are two types of rural credit sources (formal and informal credit).

2.1.4.1. Formal Financial Institutions in Ethiopia

Financial institutions are classified as governmental or private organizations, they have various functions. For instance, gathering money from savers and guiding those savers to individual households, and businesses observing for credit. Financial institutions are composed of deposit-type institutions (bank and non-bank contractual saving institutions), personal and business financial

companies, government and quasi-government agencies, and miscellaneous lenders (Greenwald & Associates, 1983 cited as Sisay, 2008).

Formal financial institutions are an organization, which is owned, controlled, licensed, and registered by Governments (Mohieldin & Wright, 2000). In Ethiopia, the expansion of the financial sector is a long history and involves the collection of banking and non-banking sectors. Financial institutions in Ethiopia include; commercial banks, development banks, specialized financial institutions, insurance companies, credit and savings cooperatives, and microfinance institutions (owned by regional governments, NGOs, associations, and individuals). Those institutions are structured and managed by the national bank of Ethiopia (NBE).

In Ethiopia, there were 17 Ethiopian insurance companies, one is government-owned, nine of which are composite insurance companies, meaning those that transact both general and long-term insurance in Ethiopia, and eight deal with general insurance only (NBE, 2018). Despite strict government regulations through lending quota, bond buying, windfall tax, and increased capital requirements, banks are reporting strong profits and paying high dividends.

According to the December 2018 report of NBE (2018), the number of banks remained at 18 of which 16 were private and 2 public. There is also the Development Bank of Ethiopia (DBE), which is not considered a commercial bank. Commercial Bank of Ethiopia is the largest, controlling the majority of assets of the industry. These banks opened 164 new bank branches during the review quarter, raising the total number of bank branches to 4,625 of which about 34.4% were found in Addis Ababa. The report stated that the population to bank branch ratio stood at 20,865.56. Of the total bank branches, the share of public banks was 31.8 percent while private banks accounted for 68.2%.

The Insurance Company of Ethiopia increased its branches to 518 from 465 a year ago and its total capital reached Birr 4.7 billion, of which 74.6 percent was that of private insurers. Of the total branches, about 53.9 percent were located in Addis Ababa (NBE, 2018). In formal credit institutions, there are three types of formal institutions. The first one is microfinance, the second one is Amhara credit and saving, and lastly cooperatives Microfinance institutions in Ethiopia.

Microfinance is the system of delivering a wide type of financial services to low-income micro-enterprises and households. It is a method of financial development that has primarily motivated on easing of poverty by providing financial services to the poor (Bizuayehu et al., 2019).

Microfinance, also named microcredit, is a type of banking service provided to jobless or low-income individuals or groups who else would have no other access to financial services (Mohieldin & Wright, 2000). In Ethiopia, there were 36 micro-finance institutions (MFIs) that organized Birr

28.4 -13824 in saving deposits. The deposits of MFIs increase annually by 40.2% whereas their credit expanded by 38.5 percent (NBE, 2018). The MFIs had a total of 1,755 branches and sub-branches, according to the Second Quarter NBE bulletin 2017/18. The total number of active borrowing clients of the microfinance institutions in Ethiopia reached over 2.4 million customers.

In developing countries the aim of microfinance institutions is by spreading microfinance opportunities, people have access to small amounts of credit, which can then discontinue poverty in a quick step. The extent to which microfinance programs can reach the poorest of the poor remains an open argument (Sisay, 2008). Microfinance is also able to let entrepreneurs in developing countries be able to create new employment opportunities for others, with more people able to work and earn an income, the rest of the local economy benefits as there are more revenues available to move through local businesses and service providers. The combination of credit schemes in Ethiopia is initiated by local NGOs. Like the Relief Society of Tigray (REST) and the Association for Rehabilitation and Development in Amhara (ARDA).

Amhara credit and saving institution (ACSI)

ACSI can be treated as the first modern microfinance institution in Ethiopia and its task is drawn back to 1995 as a branch by the introduction of the previous Ethiopian relief organization (ERO) at this time organization for Rehabilitation and development in Amhara (ORDA), an original NGO involved in progress events in Amhara region (Gobezie, 2005). ACSI presently has wide subdivision networks, covering all districts and sub-districts of the Amhara Region, the second populous regional state in Ethiopia. ACSI delivers all chief types of financial services including voluntary savings, credit, money transfer, and fund management services. To expand its reach to the community, ACSI is currently pilot testing mobile banking services (M-BIRR, POS services, e-voucher, and others). ACSI strongly believes that over the coming years, further efforts have to be enhanced to diversify the available financial products and services (ACSI, 2017).

As of March 2017, ACSI has more than 1.1 million active borrowers and 5.4 million Active voluntary savings clients. In the same period, the total net savings mobilized, and the gross The outstanding loan amount is Birr 10.8 -13824 and Birr 11.2 billion, respectively. ACSI's Outreach covers the poorest of the poor, all areas including marginalized and geographically Remote locations, trying to address most of the financial service needs of economic sectors. ACSI   is currently initiating to establish subsidiary companies that can support the Development and effectiveness of the microfinance sector, among which the ACSI Training

In addition, Research Center (ACSI TRC) is one. ACSI Training and Research Center is recently Established to fill the capacity-building gap, particularly in the areas of training, research, and Consultancy services needs of the microfinance and other development programs and Industries (Asci, 2017).

Cooperatives

According to Berhan and Geremew (2018) Cooperatives are a business enterprise that searches to slow down a balance between pursuing profit and meeting the needs and interests of members and their communities. Cooperatives are not only making available members with economic opportunities but also providing them with a wide range of services and opportunities. In the past period, Ethiopia has experienced a modern cooperative movement since 1960 (Sisay, 2008). While the cooperative principles and values were announced in the last imperial period, which is limited to their number, membership, and amount of capital mainly paying attention to agricultural activities.

In Ethiopia there was a strong enlargement of cooperatives after the 1974 revolution, however, the international principles and values were despoiled by the government in favor of encouraging the socialist ideology in the rural areas of the country using cooperatives as means of reaching its objective. This resulted in that; several cooperatives in rural areas remaining strong feeling during 1991. In the meantime 1991, still; rules of economic liberalization in Ethiopia have been working in liberating the economy from inelastic state control by uncovering Ethiopians to domestic and international free-market competition. Bring about quicker and maintainable economic growth and making sure that the welfare of growth spread to the poor is the foremost essential agenda of the Government. In proportion to this rule, the government has provided high priority to developing agriculture lead industrialization and economic growth partly by stimulating the development of autonomous cooperatives to strengthen the productivity of the market and financial sector in the rural areas (Berhan & Geremew, 2018). Cooperatives have obtained due attention at least in the development discourse as well as programs designed to reduce poverty.

Cooperatives are community-based, rooted in democracy, flexible, and have participatory involvement, which makes them well suited for economic development (Tesfamariam, 2015). In the service provision, cooperatives make decisions that balance the need for profitability with the welfare of their members and the community, which they serve. As cooperatives foster economies of scope and scale, they increase the bargaining power of their members providing them, among

other benefits, higher income and social protection is the leading (Bernard, 2013). A cooperative type of business is important for small land–holding, developing countries like Ethiopia. Because cooperatives promote income distribution, reduce poverty and vulnerability, and improve quality of life and social welfare. Whereas the number, type, and distribution differ from region to region, during 2018, there are more than 26,672 registered primary cooperatives compliant with 5,926,433 members throughout the country (Berhan & Geremew, 2018).

In Ethiopia, cooperatives are playing a crucial role in the country's past and current development strategy. As of 2015, there were 56,044 primary cooperatives, both agricultural and non-agricultural having nine million members throughout the country. Of these, 8,435 primary cooperatives are organized in 309 unions. Agricultural cooperatives, however, only account for about one-fourth of cooperatives in the country (Eshetie & Geremew, 2018).

2.1.4.2. Informal Credit Institutions in Ethiopia

Aryeetey et al. (2005) define informal finance as works without rules and regulations forced on the farmers by formal financial institutions. Informal finance includes professional moneylenders, rotating savings and credit associations (ROSCAs), operations of savings and credit associations, and part-time moneylenders like grain millers, traders, smallholder farmers, employers, relatives, and friends, as well as cooperative societies.

Informal financial institutions work without physical collateral, involving small loans and short term-transactions, and are described by adaptability and flexibility of operations in certain areas (Guirkinger, 2007). Among the characteristics of the informal sector, no data on their activities are available through the official statistical office (Abrham, 2014). Informal finance is based on mutual trust because it operates outside state control and legal business regulations. The material collateral such as character, reputation, kinship, and family ties plays an important role in borrowing from informal financial sources (Dejene, 1993). In addition, he defined that the large mass of the Ethiopian population makes little or no use of the formal savings and lending institutions. In Ethiopia, more than 80% of the population lives in rural areas, and a small number of banks and credit associations that are presently operational are limited to urban areas. Besides, even the urban population less uses these banks. As a result, the urban people used non-formal sources like relatives and friends, moneylenders, neighbors, Iddir, Iqqub, and Mahabir. From those, the primary sources used by the urban people are relatives and friends, moneylenders, and Iqqub and Iddir.

According to Sable (1986), the original purpose of iddir is the burial of the dead. Both iddir and member are used for community service like school, construction of roads, and installation of public utilities.

2.1.6. Rural finance reform in Ethiopia

After the removal of the power of the Derge government, changes in economic programs, as well as political, administrative, and institutional structures, were initiated to be announced by the new government. Later, financial liberalization was among the reforms that have been undertaken by the new government. Financial liberalization is a central part of an effective growth strategy. In Ethiopia financial liberalization started at the end of 1992. In Ethiopia financial reforms, reduction of priority of access to credit, interest rate liberalization, restructuring, and introduction of profitability criteria, reduced direct government control on financial intermediaries and limits bank loans to the government, enhancement of the supervisory, regulatory, and legal infrastructure of the NBE, allowing private financial intermediaries through the new entry of domestic private intermediaries (rather than the privatization of the existing ones) and introduction of treasury bills over auction markets (Sisay, 2008).

2.2. An Empirical Review on Determinants of access was mostly conducted in studies conducted in the context of unindustrialized countries;

the main concern is given to assessing empirical evidence in relation to small landholder farmers 'access to formal credit in Ethiopia. Many studies indicate small landholder farmers 'access to formal credit is a problem in developing countries.

2.2.1. Empirical reviews outside Africa

Amja & Hasnu (2007) empirically investigate ed analysis of smallholders' access to rural credit and the cost of borrowing using survey data in Pakistan. The result shows that infrastructure quality is the most important factor in determining access to formal credit. In this study, formal borrowers have significantly higher values rather than informal borrowers.

Hussain & Thapa (2015) investigated dit fungibility and analyzed its factors in Pakistan. Smallholders borrowed for repayment of outstanding loans in formal credit institutions. Moreover, Saqib et al. (2018), empirically investigated factors influencing farmers' access to agriculture in a

flood disaster in a risk-prone area in Pakistan. The result of weighted least square regression shows that socio-economic factors play a key role in farmers' access to credit. That means Education, farming experience and farm size were significant factors in farmers' access to formal credit.

As discussed by Chandio et al. (2017) in Pakistan, credit is needed in different parts of the world, mainly for the purposeuirement to improve land, purchase of fertilizers, seeds, pesticides, and purchase of farm machinery. In this study, the researchers used the probit regression model. The result of the regression shows that gender, education level, farming experience, farm size, and availability of collateral have a positive effect on access to formal credit. However, age hurts access to formal credit.

Kochar (199Kochar'sudy on the determinants of access to formal credit in India; an empirical analysis using switching regression approach. This study reveals that the operation of formal Credit sectors is significantly affected the rural economy, in both levels of income and income inequality. Moreover, Poliquit (2006) studied the accessibility of rural credit among small farmers in the Philippines. The result of the study shows that most of the respondents borrow for farm production activities, usually during the planting period. Similarly, the farmers borrow more fundamentally for the purchase of production responses like seeds, fertilizers, and chemical cal.

2.2.2. Empirical reviews in other African countries

Kiplimo et al. (2015), triedfindound the main factors that affect smallholdfarmers'ers financial services in Kenya. The result of this study reveals that household education was statistically significant with positive effect on access to formal credit. Conversely, distances to the credit source were statistically significant with negative influence on access to formal credit financial services by using logistic regression model.

Owuor (2009) observed in Kenya that literacy and education level has a significant positive influence on farm households'ability to access credit information. Using discriminant analysis to differentiate between borrowers, non-borrowers, and potential borrowers, Miller and Landman (1983) realized that higher resource base, higher risk management and higher level of education characterized borrowers.

Ololade & Olagunju (2013) studied on the determinants of credit access by rural farmers in Oyo state Nigeria by using cross-sectional data and binomial logistic regression model. The finding of these study indicated that there is significant relationship between gender, guarantor, high interest rate and access to formal credit.

Akpan et al. (2013) conducted a study on the entitled that determinants of access and demand for credit among poultry farmers in southern Nigeria by using double hurdle model. The result the of hurdle indicated the farmer's age, gender, education, farm size and distance from farmerresidenceent to lending source are important determinants of access to credit.

Oboh & Kushwaha (2015) studied on the effect of socio-economic determinants on ofonnmers' loan size by arable crop farmers in Benue State, Nigeria. In this study, the researchers used multiple regression analysis. The result of regression analysis indicated that distance, farm size, length of loan de, lay and visitation by lenders have positisignificanceant on access to formal credit. Udry (1991) focused on the entitled a competitive analysis of rural credit in northern Nigeria. Using a competitive model of the credit market, the result of the study showed that seasonal fluctuations in income, gender, education level of the household head, family s, size, and area of operational holdings aan re important determinants of access to formal credit. Anang et al., (2015), conducted a study in June (2015) that entitled on access to agricultural microcredit in Ghana. In this study, the result the of Hackman selection model indicated that gender, cattle owners, hip, and improved technology adoption were significant factors in determining farmers' loan size.

Dzadze et al. (2012) also conducted on factors that limit or increase smallholdfarmers'r access to formal credit in the abura asebu Kwamankese district of the central region of Ghana by using logistics regression model. The regression result shows that extension contact, saving habit and education level significantly impacted farmers' access to formal credit. This study stated that the odd of a smallholder accessing formal credit is increased by saving habit, education and extension contact respectively.

Mpuga (2010) examines constraints in access to and demand for rural credit in Uganda. The study used Probit, Tobit and multinomial logit model. The result of the study showed that age of an individual emphatically identified with the choice to apply for credit and the measure of credit applied. Mpuga adds that young farmers tend to save and seek credit as opposed to old farmers. Tang et al. (2010) opposed Mpuga (2010) stating that the opposite is quite true since older farmers have more social capital and networks compared to the young farmers. (Nwaru, 2009) disagreed with both stating that age of an individual does not affect demand on credit.

A study in Madagascar by Zeller (1994) focused on the determinants of credit rationing among formal and informal lenders. The regression result indicated that the probability of applying for informal credit increases with age, years of education, and number of sick days of household during the recall period. On the other hand, the probability of being credit constrained by the informal lender increases with age, and years of education.

Mohieldin and Wright (2000) examine empirically the markets for formal and informal credit in Egypt. The result indicated that educational level, ownership of land, total assets, and size of the households are significant factors of access to formal credit by using a probit analysis. Chivandire (2019) studied on identifying the major factors affecting access to formal credit by smallholder farmers with particular reference to Chivi district, Zimbabwe. The logit model reveals that demographic factors like, age of household head, sex, household size, marital status and household education level and economic activities of households are determinant of access to formal credit.

2.2.3. Empirical Reviews in Ethiopia

Hussein (2007) conducted on understand and explain farm household economic behavior with reference to saving, credit and production efficiency under imperfect financial market conditions in Southeastern Ethiopia. Saving behavior of farm households was affected by factors related more to incentives and opportunities to save than to ability to save. Data was analyzed using stochastic frontier analysis and limited dependent variable econometric tools.

Kiros (2012) observed in Tigray region that education, land size, distance and livestock ownership are the major determinants of credit access. The researcher uses bivariate probit model.

Ayele & Goshu (2018), Examined factors determining microfinance loan utilization by smallholder farmers from Omo Microfinance institution in Lemo District of Hadiya Zone. The study uses univariate probit regression model. The results showed that literacy, household size, size of landholding and distance from residence to lending center were the significant determinants of access to formal credit.

Muse (2016) also conducted a study that entitled on the —determinants of household level access to formal financial services‖ in Hawasa, Sidama zone. In his study, Binary logistic regression model was used. The result of the study showed that demographic factors like, (Age, Sex and education), institutional factors like, (participation of households in extension package program, lending procedure, family labor), socioeconomic factors like, (size of farm land, livestock ownership, experience in credit use), communication factors like, (distance from lending institutions and extension contact) are the most important determinants of access to formal credit.

Sisay (2008) studied on smallholder farmer‘s access to formal credit in the Amhara region, north Gondar. The study uses binary logistic regression model. The result the of logit model indicates access to formal credit was positively and significantly affected by participation in extension package programs; farm household‘s experiences in credit uses from formal credit institutions and total

cultivated land size. Nevertheless, number of livestock unit in tropical livestock unit (TLU) and farmers perception of group lending negatively and significantly affect access to formal credit.

2.3. Summary and Knowledge Gap

Access to credit were fundamental for small landholder farmers in industrializing countries of the world. Credit leads to an increase in spending, higher GDP (gross domestic product) and thereby faster productivity growth, thus increasing income levels in the economy. Access to credit enables operational and capital investment where farmers get credit to buy seed, fertilizer and other equipment during the planting season. It plays a basic role in covering consumption insufficiencies of farm landholdings and using as income transfer instrument to eradicate the imbalances in income distribution among the small, middle, and big farmers. However, access to formal credit were affecting by both socio-economic and institutional variables.

In Ethiopia, some researchers conducting in various regions. For example, the study by muse (2016) analyzes the determinants of landholdings level access to formal finance in Sidama zone; the study by Samuel (2020) assuming in wolaita zone; the study by Sareay (2008) assesses determinants of access to formal credit in North Shewa. However, those studies were limiting in describing rather than explaining the factors contributing for access to formal credit. In additiomostost of the empirical literatures were the same but; the studies were different in their research design, approach, and coverage of geographical area. In addition, there were inconsistency in their research question, methodology, objectives, most of the literatures focuses on both formal and informal credit institutions and does not include all-important variables on their study.

Therefore, the research's tries to fill the gap by adding such two variables as the saving culture of landholdings in formal credit institutions and the amount of deposit interest rate by formal credit institutions that affect small landholder farmers 'access to formal credit for the case of Debrebrhan Zuria woreda using 360 small landholder farmers.

2.4. Conceptual Framework

When faced with limited credit access rural households make decisions with the motive of increasing their credit access as well as improving repayment performance. However, what is observed was the type of borrowing decision. To model, the household access to credit the first step was to analyze the rural household type of borrowing. Assuming that a household has two alternative types of borrowing i.e. group and individual borrowing, then their decision will depend on the relative advantage of each type of borrowing and its contribution to repayment performance. Any borrowing type with more expected access to credit has a higher likelihood that it would be chosen. As shown in figure 1, various factors inter-relate to influence household access to credit and repayment performance.

This study was built on the premise that joining and actively participating in a microcredit group results in improved credit access and repayment performance. Therefore, households who join and actively participate in micro-credit groups were expected to benefit from access to credit without collaterals and improved repayment performance. The decisions to either join a micro-credit group or not are assumed to be determined by household demographic factors, farm attributes, and institutional factors. The next stage in-group borrowing category was the level of participation in the micro-credit groups measured by the number of loans borrowed by each group member. This was influenced by an additional set of variables social capital dimensions. On the other hand, those who have tangible collaterals opt for the individual borrowing category.

The dependent variables in this study were participation/joining a micro-credit group and the level of participation in the micro-credit group. To model such a decision-making process Tobit, Heckman's two-step procedures, and double hurdle models could be used however, faced with such situations, the assumption of simultaneous and sequential decisions is usually considered. A Tobit model assumes that thhousthehe hold makes the decision simultaneously (Sindi, 2008). The Heckman two-step procedure and double hurdle models used two-stage procedures where the first stage models the household's choice to join a micro-credit group and the second stage models the level of participation.

In this study, the decision to join a micro-credit group and the level of participation may not necessarily be jointly determined. Consequently, the decision to join a micro-credit group could precede the level of participation depending on the prevailing factors. In such a scenario io, there was a high likelihood that household will only increase their number of borrowings if there was a strong cohesion within the

micro-credit group enhanced by social capital dimensions. In this study, the factors that determine the decision to join a micro-credit group and the decision on the level of participation are different given the existence of social capital dimensions, which only determine the household number of borrowings. Additionally, since the observed number of borrowings was nonrandom and conditional on the decision to join a micro-credit group then sample selection problem was introduced. To correct this Heckman two-step procedure was a suitable model and consequently was adopted for this study.

Demographic Factors	**Farm/Household Attributes**	**Institutional Factors**
- Age	- Farm size	- Size of loan
- Gender	- Main occupation	- Distance to the nearest MFI
- Education	- Income	- Loan interest rate
- Household size		- Group size
		- Contact with loan officers

Decision Making
To join Micro-credit group or not

Group Borrower

Individual Borrower

Social Capital Dimensions
-Density of membership
-Heterogeneity of group
-Member contribution
-Frequency of meetings
-Participation decision Making

-Availability of collaterals
-Credit rationing
-Loan interest rate

Level of Participation

Outcome
- Access to credit
- Loan repayment performance.

Double hurdle model unsuitable as it assumes that the same factors that determine participation also determine level of participation.   **Fig .1.Conceptual Framework**

Source: Representing by the researcher basing on literature

Review (2022) and *Source: Author's Conceptualization.*

CHAPTER - THREE

Research Methodology

3. Introduction

The previous Literature review deals with a review of relating literature on determinants of access to formal credit for small landholder farmers. This part provides a brief overview of the research approach, research design, population of the study, sampling method, method of data collection and its source, data analyses, and model specification of the study.

3.1. Description of the study area

DEBREBRHAN (*Semen Shewa*) was a zone in the Amhara region of Ethiopia. Debrebrhan takes its name from the kingdom or former province of Shewa. The Zone was bordered on the south and the west by the Oromia Region, on the north by South Wollo, on the northeast by the Oromia Zone, and on the east by the Afar Region. The highest point in the Zone was Mount Abuye Minga (4012 meters), which was found in Gish Rabel woreda; other prominent peaks include Mount Megezez. Towns and cities in Debrebrhan include Shewa Robit. Debre Birhan is a city in central Ethiopia. Located in the Semien Shewa Zone of the Amhara Region, about 120 kilometers northeast of Addis Ababa on Ethiopian highway 2, the town has an elevation of 2,840 meters, which makes it the highest town of this size in Africa. Woreda was originally named **Debre Berhan** ("Greater Debre Berhan"), the name used in the 1994 national census, but it was changed before the Ethiopian Agricultural Sample Survey in October 2001, which used the present name. The Battle of Segale was fought on 27 October 1916 in this woreda. In this battle, the supporters of Emperor Iyasu V of Ethiopia were defeated, which secured the outcome of the palace coup the previous month, in which Zewditu had been proclaimed Empress. The administrative subdivisions of this Zone have been renamed, divided, and their boundaries were redrawn numerous times between the 1994 and 2007 national censuses far more often than any other Zone in the Amhara Region. As a result, its subdivisions can be very confusing; Svein Ege, in his comparison of how the Central Statistical Agency (CSA) and the Ethiopian Mapping Authority reported the administrative boundaries in this Zone and how they changed between 1994 and 2004, stopped halfway through this Zone, stating that he had run out of time to perform field checking.
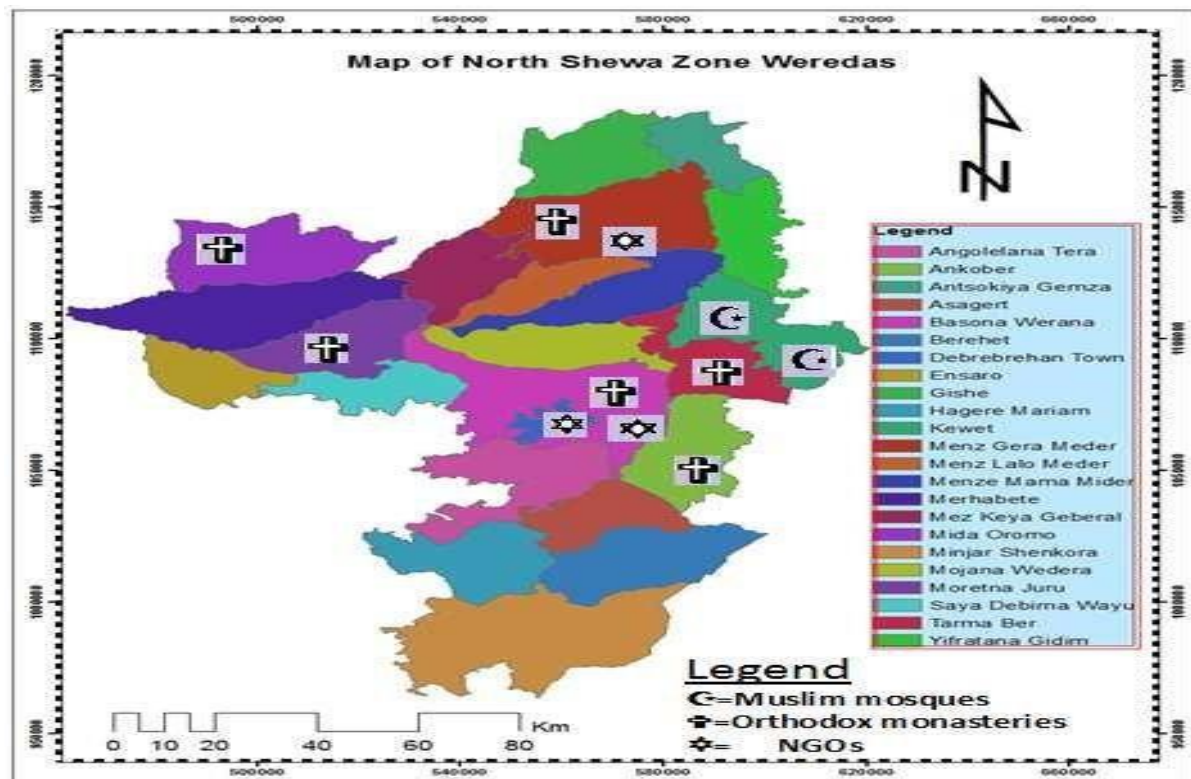
Figure 2: Map of the study Area: - Map of Debrebrhan   Zone Woredas

3.2. Research approach

According to Creswell (2003), the three types of research approaches that were familiar to business and social science research were quantitative, qualitative, and mixing approaches.

Quantitative research were depending on the measurement of quantity or amount. It is applied to phenomena that can be expressed in terms of quantity (Kothari, 2004). Quantitative research was a means for testing objective theories by examining the relationship among variables

This study applied a mixing research approach to examine the relationship between access to formal credit and various independent variables.

3.3. Research design

A research design was the plan and procedure for the research to choose from a broad assumption method of data collection and analysis it was the overall plan for the conceptual research problems to the pertinent and achievable research. In other words, a research design expresses what data were required, and what methods were appropriate to collect and analyze.

According to Lowered et al. (2009), there were three types of design in the research study. Those were descriptive research design, exploratory research design, and explanatory research design. Descriptive research studies were those studies, which were concerned with describing the characteristics of a particular individual, or group. It helps to provide an accurate picture of the phenomena event or people. The main aim of descriptive research was to provide an accurate and valid representation of variables that were relevant to the research question.

An exploratory research design that was addressing a subject about which there were high levels of uncertainty and ignorance about the subject, and when the problem was not all right understood or little or no existing research on the topic matter.

The main aim of exploratory research was to identify the boundaries of the environment in which the issues, opportunities, or situations of interest were likely to reside and to identify the silent factors or variables that might be found there and be of relevance to the research. In an explanatory research design, the main aim was to identify any causal links between the factors that pertain to the research problem. Since the current research was on the determinants of access to formal credit, using both descriptive and explanatory research design. That means Descriptive research was a type of research that was used to describe the characteristics of a population and exploratory research was a methodology approach that investigates research questions that had not previously been studied in depth.

3.4. Population of the Study

The target population of the study Consists of small landholder farmers in the Debrebrhan Zuria district. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), This Zone had a total population of 1,837,490, an increase of 17.72% over the 1994 census, of whom 928,694 were men and 908,796 women. Among the total population of Debrebrhan Zuria woreda, 40,893 were rural agricultural landholding heads, out of which 50.1%. In addition, 49.9% were male and female heading landholdings respectively (Debrebrhan Zuria woreda office of Agriculture, 2019).

3.5. Sample selection and sample size

A multi-stage sampling technique was used to select 360 small landholder farmers for the study. Firstly, Debrebrhan Zuria woreda was purposively chosen, due to there were financial institutions in each kebeles, which give loans to small landholder farmers, majority of the population makes farming their primary occupation and main source of income. The woreda contains 23 rural kebeles. Secondly, simple random sampling was used to select three out of o23 kebeles using the lottery method. In the third stage, sample sizes were determined using the simplifying formula provided by Yamane (1997). Out of the total 40,893 landholdings, 360 landholdings were selected using simple random sampling methods. Final respondents were drawn to each representative kebeles by using the following proportional allocation principle.

The total target population of this study was 40,893. According to Kothari (2004), due to many factors, the researcher was determining the sample size. The researcher was confident at 95% at a specified level of precision e (0.05). The simplifying formula developed by Yamane

(1967) were as follows. $n = {}^{N}\!/1 + (e)\,2$

Where, N- population size

n- Sample size e- Margin

of error (5%)

$$n = \frac{40{,}893}{1 + 40{,}893(0.5)2} = \mathbf{396}$$

Table 1: Target population of the study out of total target 40,893 total population is

Name Of kebeles	Male	Female	Total	Required sample size from each kebeles	Strata actual sample Size
Minjarshenkora	1239	276	1515	396*1515/ 4275 = **140**	F =140* 276/1515= 26 M=140*1239/1515=114
Ensaro	909	158	1067	396* 1067/ 4275 = **99**	F= 99* 158/1067= 15 M= 99*909/1067= 84
Hageremariyam	1449	244	1693	396* 1693/ 4275 = **157**	F=157*244/1693= 23 M=157*1449/1693=134
Total	**3597**	678	4275	396	396

Female headed HHs	64				
Male headed HHs	332				

Source: data collect from office of agriculture and own computation, 2022

3.6. Method of data collection and its sources

To achieve the objectives of the study, cross-sectional data were collected from both primary and secondary sources. Primary data were obtained through structuring questionnaires from small landholder farmers and interview these questionnaires' were in-house survey, dichotomous questions, and Scaling questions. Secondary data were collected from Debrebrhan   Zuria woreda office of agriculture, Amhara credit and saving institutions (ACSI), commercial bank of Ethiopia (CBE), Unpublishing study documents, and other official reports. But only and also This study uses secondary data obtained from Stein Terje Holden (professor at NMBU), who Supervising and guided students of Norwegian University for Life Science (now known as NMBU) together with

those from Debrebrhan   University (Ethiopia) in 2003 and 2010 under the NOMA program. At the same time, the use of questionnaires as a primary data collection method was associated with the following shortcomings, random answer choices by respondents without properly reading the question. In closing-ending questionnaires no possibility for respondents to express their additional thoughts about the matter due to the absence of a relevant question, collecting incomplete or inaccurate information because respondents may not be able to understand questions correctly, high rate of non-response. As the primary data collection method, offer the following advantages. Uniformity, all respondents were asked the same questions, cost-effectiveness possibility to collect the primary data in a shorter period, minimum or no bias from the researcher during the data collection process, usually, enough time for respondents to think before answering questions, as opposing to interviews, possibility to reach respondents in distant areas through an online questionnaire.

This landholdings survey data were collected from three woredas three of them from the Debrebrhan Region, Northern Ethiopia. The landholdings surveys include landholdings' basic characteristics, landholdings consumption, credit information, durable assets, sales of crops and livestock, and plot-level information. The landholdings surveys were conducted to understand factors determining a demand for credit in Debrebrhan and present facts to the attention of policymakers in their attempts to improve access to credit to the people of the Debrebrhan Region. All questions were prepared in English and translated into the Amharic language for collecting data from farmers. In types of questionaries' multiple-choice questions, respondents were offered a set of answers they had to choose from that. The downsize of the questionnaire with multiple-choice questions was that, if there were too many answers to choose from, it makes the questionnaire, confusing and boring, and discourages the respondent to answer the questionnaire. Dichotomous Questions, these type of questions gives two options to respondents – yes or no, to choose from that. It was the easiest form of a questionnaire for the respondent in terms of responding to it. Scaling Questions, also referred to as ranking questions, present an option for respondents to rank the available answers to questions on a scale of a given range of values (for example from one to 10). An in-house survey **is** this type of questionnaire that involves the researcher visiting respondents in their houses or workplaces. The advantage of an in-house survey was that more focus on the questions could be gained from respondents. However, in-house surveys also had a range of dare advantages, which include being time-consuming, and more

expensive, and respondents may not wiser to have the researcher in their houses or workplaces for various reasons. Therefore, the studies tried to work practically on this type of questionnaire.

3.7. Method of Data Analysis

The researcher uses descriptive and inferential statics like the chi-square test for data analysis. Descriptive Statics such as percentage, frequency, cross-tab, and Binary regression analysis was used to summarize the results that generating by respondents of the research questionnaire and provide a clear picture for both reader and researcher. Binary Logistic regression was used to assess the explanatory variables and access to formal credit of small landholder fafarmersith the help of SPSS version 20.

Finally, content analysis wewassusedo analyze qualitative data gegeneratedrom interviews and documents.

3.7.1. Tests of Validity and Reliability

3.7.1.1. Validity test

Validity refers to the extent to which a measure adequately represents the underlying construct that wewasusupposedo measure. According to Hair, Black, Babin, & Anderson (2014), validity was the degree to which a measure accurately represents what it was supposed to. It means that the instrument measures what it was supposed to measure, that all questions were accurately measuring the concepts they were intended to measure, and that every question relates directly and spastically to the impact demographic, socio-economic, and institutional characteristics on access to formal credit. Structuring questionnaires were to collecting the data.

To test the acceptance and eligibility of the questionnaire, the researcher revises the literature including the Advisor's comment in the preparation of the questionnaire to validate it.

3.7.1.2. Reliability test

In order to make the questionnaire were reliable; the researcher uses a pilot method of study, that something to be testing before wider introduction. In order to know whether, the internal consistency, the reliability were good or not, the researcher using Cronbach's alpha test. Thus, it were better to see the Cronbach's alpha reliability test statics result, which ranges from -1 to +1.

if the Cronbach's alpha output becomes greater than 0.7, it indicates that all the items or the questions with regarding to the respective variable were good, highly correlating and reliable. Cronbach's alpha were exist between 0.60 to 0.70, it indicates fair reliability, and the coefficient from 0.70 to 0.80 were indicating as a good reliability and if the coefficient were larger than 0.80, it was considering as excellent reliability which means that there was high internal consistency among the variables.

3.8. Assumption of binary Logistic regression model

As the dependent variable of the study was dichotomous, binary Logistic regression was used for the main analysis of the determinants of access to formal credit. Binary Logistic regression were used when:

✓ The dependent variable to binary.

✓ The observation was independent of each other. On the other hand, it means the observations should not come from repeating measurements or matching data.

✓ There was little or no multi-collinearity among the explanatory variables. This means the independent variables should not be too highly correlated with each other.

✓ There was a linear relationship between independent variables and log odds. This analysis does not require the dependent variable and independent variables to be related linearly, it requires the independent variables were linearly related to the log odds.

✓ There was a large sample size. The LR test was performed by estimating two models and comparing the fit of one model to the fit of the other. Removing prenticing variables from a model will usually make the model fit less well (i.e., a model will have a lower log-likelihood), but it was necessary to test whether the observing difference in model fit was spastically significant. The likelihood, test statistics chi-square ($x2$) were commonly used for examining the overall fitness of the Logistic regression model to see the correspondence between observed data and the values expected based on theory. The likelihood ratio test, also called the log-likelihood test, was based on -2LL (-two times log-likelihood). The likelihood and ratio statistics were obtained by subtracting two times log-likelihood (-2LL) for the final (full) model from the log-likelihood for the intercept-only model. This log likelihood-ratio test uses the ratio of the maximizing value of the likelihood, function for the intercept-only model L0

over the maximizing value of the likelihood function for the full model L1. Where the likelihood test statistics were given = **-2(lnL0-ln1 = -2(LL0-LL1)** Where, LL0 was the likelihood value of the model that had the intercept term only and LL1 was the log-likelihood value of the full model, where L0 was the likelihood function of null model and ln1 were the likelihood function of the full model.

3.9. Model Specification

To check the relationship between dependent, and independent variables, and the significance of the overall model at a 95 % level of significance.

Using the binary Logistics regression model, a logit distribution function model was developed (J. S Kramer, 1991). Since the outcome, variable access to formal credit was binary or dichotomous and the explanatory variables were categorical variables the researcher was interested to use the binary Logistic model.

$$P\ (yi=1) = 1\frac{1}{1+e^{(-\beta ixi)}} \quad \text{------------------------------------} (1)$$

$$P\ (yi=1) = 1\frac{1}{1+e^{(-zi)}} \quad \text{------------------------------------} (2)$$

Where p (Yi=1) is the probability of a farmer having a credit access

Xi= was a function of a vector explanatory variables

E= represented natural logarithms and equation (2) was the cumulative Distribution function. 1-p (yi=1) represents the probability of farmers does not have credit and represents as;

$$\textbf{1-p (yi=1)} = 1\text{-}1\underline{\hspace{2cm}} + (zi) \quad \text{------------------------------------} (3$$

$$(yi=1)1+e^{zi} \quad zi \ \underline{\hspace{1.5cm}} \quad \text{------------} (4)$$

$$\frac{1-p(yi=1)}{} = 1+e^{-zi} = e$$

Equation (4) was the odds ratio, which represents the ratio of the probability that a farmer was deciding to receive a credit to the probability that they were not deciding to receive credit. Y = f (x) where Y was the dependent variable and X was the set of explanatory variables.

$$Y_i = \beta_0 + X_1\beta_1 + X_2\beta_2 + X_3\beta_3 + X_4\beta_4 + X_5\beta_5 + X_6\beta_6 + X_7\beta_7 + \mathbf{X}\beta_{\mathbf{8}} + X_9\beta_9 + X_{10}\beta_{10} + X_{11}\beta_{11} + X_{12}\beta_{12} + X_{13}\beta_{13} + \mu$$

Y_i= Access to formal credit; β_0 &β_I = Coefficients; μ = Error terms; X_i= set of explanatory variables. Where; Y_i =1, the respondents response were credit access and Y_i= 0, the respondent's response were without access.

3.10. Variables Description and Measurement of Variables

Thus, This section explains the variables used as dependent and independent (Explanatory) variables in the study. The definitions and measurements that were used for these variables were described as follows.

3.10.1. Dependent variables description

Small landholder farmers' access to formal credit was the dependent variable, which was Affected by various independent variables. This variable was measured by the information obtained from a direct landholdings survey regarding whether landholdings were currently a user of formal credit services or not. Respondents who requested for credit and were not effective or rejected and who did not make any request were all together considered as without credit access whereas, respondents that requested and get credit were calling with credit access. The dependent variable was Dummy, which was represented by the value ―1‖ for with credit access and ―2‖ for without credit access.

3.10.2. Independent variables

Among the number of factors, which were relating to access to formal credit for small landholder farmers. In This study, the following demographic, socio-economic, and institutional factors were hypothesized to express the dependent variable.

i. **Age:** was a categorical variable, treated as household heads during the time of household survey measured in years. Age was another important demographic factor that does not affect

access to formal credit for small landholder farmers. The conclusions by researchers on age and access to formal credit were mixed. Many researchers draw their conclusion based on the idea that mature working-age farmers (55-64 years) may have high responsibility and high collateral This makes them higher in accepting credit access. Yehuala (2008) & Mesfin et al., (2017) concludes that older farmers were more credit accessed.

In addition, others such as (Christina, 2017; Abraham, 2014) stated that the age of households doesn't affect access to formal credit.

Ha1: The age of households had no significant impact on access to formal credit

ii. **Sex:** was a dummy variable, which assumes a value of ―1‖ if the household head were male and ―0‖ otherwise. According to Kyalo Musembi (2019), male-headed households had participated in different meetings and had more exposure to information. In addition, male households could control economic resources; therefore, it was hypothesized that male-headed households had more access to formal credit from formal credit institutions. However, Dzadze *et al.* (2012) concluded that the sex of the household heads does not affect access to formal credit of small landholder farmers.

Ha2: Sex of the households had no significant impact on access to formal credit **iii. The educational level of the households**: The level of education was another factor that influences **a** household's willingness to take credit access. Many studies on education and credit access had also been carried out but the results were mixed. The majority of the study conclude that highly educated farmers take credit access. Such as Yehuala (2008) & Muse (2016) described that higher education encourages taking more financial risks. In addition, Deresse & Zerihun (2018) described that educated people received more credit. Although some other studies portray that education level does not affect the level of credit access Ololade & Olagunju (2013b) said that education was not a significant determinant of access to formal credit for farmers. Additionally, Adeola & Ayoade (2009) Level of education does not significantly affect the access to credit of farmers.

Ha3: Levels of education had no impact on farmers' access to formal credit.

iv. **Collateral:** was a dummy variable, which takes the value of ―1‖ for those who had collateral availability and ―0‖ otherwise. Small landholder farmers were expecting to form a group that can serve as collateral to take credit access from formal credit institutions. However,

households perceived that group lending if difficult access to formal credit from credible sources. Therefore, farmers who had enough assets were less likely to go for credit (Samuel Semma, 2020)

Ha4: Collateral had a significant positive impact on access to formal credit for small landholder farmers.

v. **Farm size:** It was the total land size cultivated (sum of owned cultivated land, rented-in land, and land secured through these cropping arrangements) by the household. It was a categorical variable. The larger the cultivated land size the more the labor required that demands Additional capital might be obtained through credit. Nevertheless, the main hypothesis was that farmers who had larger farm sizes and those farmers who had smaller farms were not different in accessing credit from formal credit institutions.

Ha5: farm size in hectares had no significant difference between farmers in accessing formal credit.

vi. **Saving culture:** were ordinal variable, According to Samuel Semma (2020) when farmers save a higher amount of money in financial institutions it could be substituting as collateral in providing credit.

Ha6: There was a significant influence of saving culture on access to formal credit for small landholder farmers.

vii. **Information:** were the source of information small landholder farmers get information about formal credit institutions. It was an ordinal variable, A farmer having more information about a formal credit scheme had higher awareness and tendency towards using the formal credit sources and vice versa. Information was assumed to have a positive influence on the access to formal credit for small landholder farmers (Erasto Abrham, 2014). **Ha7:** Information had a significant and positive impact on access to formal credit.

viii. **Total Livestock ownership:** Where the total number of animals possessed by the household. It was a continuous variable. As the total number of animals in the household increases, the household would be less likely to go for credit (Erasto Abrham, 2014).

Ha8: livestock had a significant negative impact on access to formal credit for small landholder farmers.

ix. **Experience in credit use:** Were several years the households get access to credit from formal credit institutions. This was a continuous variable; a farmer having more experience in formal credit use will have a higher tendency towards using the formal credit sources and vice versa (Gebeyehu et al., 2019)**.**

   Ha9: experience in credit use had a significant positive influence on access to formal credit for small landholder farmers.

x. **Distance from a lending institution:** It refers to the distance (in km) of the rural households from formal credit institutions. Were an ordinal variable (Kidane et al., 2018)? A farmer who lives near / far from the lending institutions had no different location advantage in accessing formal credit.

   Ha10: distance from lending institutions had no significant influence on access to formal credit for small landholder farmers.

xi. **Infrastructure:** Particularly all-weather roads that connect rural to urban were taking this road access as determinants for household-level access to formal credit in the study area. Were an ordinal variable; in this study infrastructure was not the determinant of access to formal credit.

   Ha11: Infrastructure had no significant impact on access to formal credit for small landholder farmers.

xii. **Lending procedure:** To get formal finance from credit institutions farmers were predictable to pass over different methods, which were time taking, cumbersome, and sometimes difficult to understand. It was an ordinal variable; almost all the respondents were responding that the lending procedures of formal credit institutions were not difficult in accessing formal credit.

   Ha12: the lending procedure of financial institutions had no significant impact on access to formal credit for small landholder farmers.

xiii. **Interest to credit (deposit):** was an ordinal variable, the deposit interest rate was the amount of money paid to save households at the time of withdrawals and it was the most important variable in determining access to formal credit (Elsevier B.V., 2019). **Ha13:** deposit interest rate had a significant and positive impact on access to formal credit for small landholder farmers.

Summary of explanatory variables

Table 2. : Dependent and independent variables of the study.

Symbol	Variable represents	Measurement	Source
ACFC	Access to formal credit	Dummy variable coded as 1 if household uses credit 2 if not use	Survey data, 2021
AGE	The households age	continous coded as 1if from 15- 24 years, 2 if from 25-54 years, 3 if from 55-64 years and if from 65-80, and finally above 65 years	Muse, (2016)
SEX	Households sex	1 for Male and 2 for Female	KyaloMusembi,
Education	Highest Education Level of households	Categorical variable codded as 1if it were no formal schooling, 2 if it were no formal schooling, 2 if it were Adult education, 3 if it were primary level, and 4 if it were Secondary level, 5 if it degree holders	Kangogo et al
Collateral	Collateral	Dummy (0 if it were no, 1 if it was yes	Chandio, et, al (2017)
Farm size	Farmers farm size In	1 if Less than 1 hectare, 2 if Between 1 and 2 hectares 3 if Between 2 and 3 hectares 4 if Between 3 and 4 hectares	Samuel Semma, (2020)
Saving culture	Saving habit Of households	Ordinal (from strongly dis agree to strongly agree)	Mekonnen et al. (2017)
Information	Access of information for farmers	Interval (from strongly dis agree to strongly agree)	Erasto, (2014)

CHAPTER - FOUR:

DATA PRESENTATION AND ANALYSIS

4.0. Introduction

This chapter presents data analysis and discusses the results of the study. This chapter was divided into two main sections. The first section summarizes the result of the descriptive analysis of variables of the study that comes from farmers using structured questionnaires and direct interviews with ACSI officers. The second section presents the result of the binary Logistic regression analysis about the determinants of access to formal credit for small landholder farmers**.**

4.1.1. Response rate:

In survey research, response rate, also known as completion rate or return rate was the **number of people who answered the survey divided by the number of people in the sample**. It was usually expressed in the form of a percentage. The response rate was the percentage of people who complete your survey out of the number of potential participants contacted. A high (or "acceptable") study response rate was important **to ensure your results are representative of your target sample and that your questionnaire is performing as intended**

396 questionnaires were prepared and distributed to the respondent i.e. three randomly selected kebeles (**Ensaro, Hagere Maryam, and minjar she kora**). So, the response rate was computed as the total questionnaire returned divided by the total questionnaire distributed to the respondents multiplied by 100. Of the total 396 questionnaires 360 (90%) were filled, this makes the response rate 90%, and the remaining 10% were not returned. $360/396 \times 100 = 90\%$.

3.1.2. Demographic characteristic's

Table 3: Demographic characters tics of respondents

Variable	Category	frequency	Percent	Valid percent	Commulative percent
What is your age?	15-24years	32	8.9	8.9	8.9
	15-24years	159	44.2	44.2	53.1
	55-64years	85	23.6	23.6	76.7
	65-80years	78	21.7	21.7	98.3
	Above 80 years	6	1.7	1.7	100.0
	Total	360	100.0	100.0	
What is your gender status?	Male	296	82.2	82.2	82.2
	Female	64	17.8	17.8	100.0
	Total	360	100.0	100.0	
What is your Highest education level?	Unable to read and write	105	29.2	29.2	29.2
	Adult education	89	24.7	24.7	53.9
	Primary level	102	28.3	28.3	82.2
	Secondary level	57	15.8	15.8	98.1
	Degree and above	7	1.9	1.9	100.0
	Total	360	100.0	100.0	

Source: research survey, 2022

Age of households: the study indeed, found out that 1.7 percent of those farmers above 80 years accessed formal credit as compared to 44.2 percent of 25-54 years of age who accessed credit. About 44.2 percent of those aged 25-54(matured working age) and 25.8 percent of farmers aged above 65 years accessed credit. This clearly shows the farmer aged between 25-54 and 5564years easily accessed credit than those of 15-24years, 65-80, and above 80 years farmers. It seems financial institutions take the ages of the farmers as an important parameter in approving credit applications. Similarly, age was considered a measure of maturity and degree of hard work. Therefore, the middle age was presumed by financial institutions as more responsible and mature, hence a loan they can invest wisely, resulting to prompt repayment. While, on the other hand, young farmers were considered less responsible by the financial institutions and as a result had high chances of defaulting on the loan. Additionally, older farmers over 65 years are considered an elder age. Therefore, financial institutions were considering in This age group the person's health condition, ability to repay His loan, and others. so, the existing financial institutions in the study area tend to approve most of the loans from farmers aged 25-54 years and 55-64 years than for the others as shown in figure 1. When analyzing the age relationship with access to credit as displayed in table 4.2.1, those households in the bracket from 25 to 54 years were found to be more credit accessed (44.2) than the other age brackets. However, in this cross-tabulation most farmers do not receive credit, this indicated that age was not considered a determinant of access to formal credit in the study area.

Sex of households: The sex of farmers involved in the study comprised mainly the male compared to their female counterparts as summarized in figure 2. Sex was included because males were known to have greater access to formal credit than females in most financial institutions. Male farmers accessed credit more than their female counterparts at 82.2 percent and 17.8 percent respectively. This shows that most of the divisions on accessing formal credit are mainly made by credit in the two formal credit institutions. The implication was that male-headed households had more access to formal credit than their female counterparts could be because male dominates land ownership. This was attributed to collateral security which was a requirement by financial institutions that were traditionally owned by male farmers. Indeed, this makes the sex variable an important determinant in accessing formal credit, where the female-headed households were credit constrained.

Education level of respondents: A higher level of education implies better technical knowledge, know-how, and farming skills, and more credit information accessed with bureaucratic procedures. However, about 29.2 percent of household heads never attended any formal schooling, 24.7 percent of households attend adult education, while, 28.3 percent of the households attended primary school

and the remaining 15.8 percent of households went to secondary school, and 1.9 percent had degree holders.

4.1.3. Socio-economic characteristics

Table 4. descriptive analysis of collateral

Variable	category	frequency	percent	Valid percent	Commulative percent
Do you had assets as collateral	Yes	184	51.1	51.1	51.1
	No	176	48.9	48.9	100.0
	Total	360	100.0	100.0	
How much your farm size in hectare?	lessthan1hect are	133	36.9	36.9	36.9
	1-2hectare	202	56.1	56.1	93.1
	3-4hectare	21	5.8	5.8	98.9
	4andabove	4	1.1	1.1	100.0
	Total	360	100.0	100.0	
all Peoples save their money in formal credit institutions	Strongly dis agree	122	33.9	33.9	33.9
	Dis agree	99	27.5	27.5	61.4
	Neutral	24	6.7	6.7	68.1
	Agree	57	15.8	15.8	83.9
	Strongly agree	58	16.1	16.1	100.0
	Total	360	100.0	100.0	1.4
You Had enough information about formal credit institutions.	Strongly dis agree	5	1.4	1.4	8.3
	Dis agree	25	6.9	6.9	16.7
	Neutral	30	8.3	8.3	85.6
	Agree	248	68.9	68.9	100.0
	Strongly agree	52	14.4	14.4	
	Total	360	100.0	100.0	
There is full infrastructure in our Kebeles	strongly dis agree	67	18.6	18.6	18.6
	dis agree	163	45.3	45.3	63.9
	Neutral	25	6.9	6.9	70.8
	Agree	67	18.6	18.6	89.4
	strongly agree	38	10.6	10.6	100.0
	Total	360	100.0	100.0	

Source: research survey, 2022 The result of survey indicated that 51.1 % of the respondents had different types of assets that were used as collateral such as land, house, vehicle, agricultural equipment and furniture.

However, 48.9 % of the respondents had not different types of assets used as collateral.

Farm size

Regarding farm size in hectare, in the sample, 133 (36.9 %) households had farm size that falls below 1 hectare and only 202 (56.1 %) household indicates their farm were between 1and 2 hectare the remaining 5.8 % households had between 3 hectare and 4-hectare farm size,1.1% households had 4 and above hectares . This shows that, large number of households cultivate agricultural products on small farm size.

Ethiopia's landholdings were often fragmented into small parcels, and the average farm size of **less than two hectare** were likely to decline further. Climatic factors such as light, water and rainfall, temperature, air, relative humidity and wind also affect farming. Physical factors such as topography/relief, soil and climate affect farming. Technology affects farming. Capital, the money the farmer had to invest in the farm, can be used to increase the amount of inputs into the farm, e.g. machinery, fences, seeds, fertilizer and renewing buildings. If a farmer can afford to invest capital, yields will raised and can create greater profits, which can be used for more investment. **Saving culture**

The descriptive analysis indicated that 122 (33.9 %) small landholder farmers strongly dis agree on saving culture of households. 99(27.5 %) farmers dis agree on saving culture of households in formal credit institutions. 24(6.7 %) of households were neutral on saving culture. 57(15.8%) small landholder farmers agree on saving culture of households from formal credit institutions and finally 58(16.1 %) of respondents were strongly agree on saving culture of farmers. This outcome indicated that majority of small landholder farmers were not save their money in formal credit institutions or they were not interest to save their money from formal credit institutions. We found that increasing farm size had a positive impact on farmer's net profit, as well as economic, technical and labor efficiency.

 A small farm operating under a small-scale agriculture model. Definitions vary widely for what constitutes a smallholder or small-scale farm, including factors such as size, food production technique or technology, involvement of family in labor and economic impact.

A large literature using micro-data from small-scale traditional farmers in developing countries had indeed found an inverse relationship between farm size and productivity measured by yields (output per unit of land). While yield usually biases the results toward larger farms, total output allows us to see the true productivity advantage of small farms. In all cases of data examined relatively, smaller

farm sizes were much more productive per unit area — 2 to 10 times more productive — than were larger ones.

Due to law of inheritance farms divided and sub-divided after death of owner, some farms were small due to sale of parts of holdings; some farms divided in scattered plots, many farms small.

Source of information

The descriptive analysis in the above table indicated that 5(1.4%) of respondents strongly dis agree on source of information. 25(6.9) of respondents dis agree on source of information. 30(8.3) of the respondents neutral on the source of information. 248(68.9) of respondents agree on the source of information and finally 53(14.4) of the respondents strongly agree on source of information. This outcome indicated that small landholder farmers in Debrebrhan   Zuria woreda agree and strongly agree on source of information. This means that they were information accessed about formal credit institutions. Additionally, source of information were one of the major determinants in accessing formal credit from formal credit institutions.

Tropical Livestock Units **(TLU)**

Tropical Livestock Units were livestock numbers converted to a common unit. An increased number of animals per adult available to support the household, indicates improved food security and household resilience. Relative changes to the TLU provide a direct indicator of food security risk.

Table 4.1: descriptive analysis of TLU

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Total number of in animals in TLU	360	.00	52.00	12.5389	16.08694
Valid N (Listwweree)	360				

Source: research survey, 2022

Number of livestock in tropical livestock unit in rural areas takes as an accumulation of wealth, security during emergency case. They can also exchange into cash when the demand rises. Livestock were the most important asset for the rural households in the study area. Based on storck et al. (1991) livestock population number were converted in to tropical livestock unit (TLU). The mean livestock holding of the respondent farm households were 12.5 TLU. The minimum number of livestock

maintained were none (0) and the maximum were 52 TLU. Debrebrhan owns immense but largely untapped livestock resources scattered over diverse agro-ecologies. Feed scarcity were one of the major technical constraints in livestock production and thus challenges the economic contribution of the livestock sub-sector. For optimum and sustainable livestock productivity, the available feed resource should match with the animal population in a given area. **Experience in credit use**

Experience in credit use from formal credit institutions were different among the sample households. The average years of credit experience of sample households from the formal financial institutions in the study area were 2.611 years and the maximum and minimum experience were 10 years and 0 year respectively **Table 4.2: descriptive analysis of experience in credit use**

	N	Minimum	Maximum	Mean	Std. Deviation
Household savers in the formal credit institutions had the ability repay their loan than non-savers, at how much degree you were agree as you continue to save after repaying your loan	360	0.00	10.00	2.6111	2.16425
Valid N (Listwweree)	360				

Distance from lending institutions

Table 4.3: descriptive analysis of distance from lending institution

lending institution	Frequency	Percent	Valid Percent	Cumulative Percent
strongly is agree	18	5.0	5.0	5.0
dis agree	31	8.6	8.6	13.6
Neutral	3	.8	.8	14.4
Agree strongly	140	38.9	38.9	53.3
agree	168	46.7	46.7	100.0
Total	360	100.0	100.0	

Source: research survey, 2022

As the studies had seen in table 4.9 above 18 (5 %) of the respondents strongly dis agree on distance from lending institutions. 31(8.6 %) of the respondents dis agree on distance from lending procedure. Only 3 (.8%) of the respondents neutral on distance from lending institution. 140(38.9 %) of the respondents were agree on distance from lending institutions and the remaining 168(46.7%) of the respondents were strongly agree on distance from lending institutions. The result showed that majority of households says that there were a difficulty with related to distance. To get the credit access from formal credit institutions small landholder farmers need to be goes long distance in kilometers. However, Access to formal credit were not influenced by distance.

Infrastructure

In the above table the descriptive analysis indicated that 67(18.6 %) farmers strongly dis agree on access rural road in their kebeles. 163(45.3 %) respondents dis agree on infrastructure. 25(6.9 %) farmers neutral on access of rural road. 67(18.6 %) respondents agree on access of rural road and the remaining 38(10.6 %) of respondents strongly agree on access of rural road. The result shows that majority of the respondents said that there were no full infrastructure in their kebeles.

However, in accessing formal credit infrastructure were not considered as the main factor.

4.1.4. Institutional characteristics

Table 4.4 descriptive analysis of Institutional characteristics

Variable	category	Frequency	Percent	Valid Percent	Commulative percent
The lending procedure of formal credit institution are very complicated	strongly dis agree	137	38.1	38.1	38.1
	dis agree	79	21.9	21.9	60.0
	Neutral	15	4.2	4.2	64.2
	Agree	107	29.7	29.7	93.9
	strongly agree	22	6.1	6.1	100.0
	Total	360	100.0	100.0	
The interest rate of ACSI were higher than CBE	strongly dis agree	151	41.9	41.9	41.9
	dis agree	84	23.3	23.3	65.3
	Neutral	101	28.1	28.1	93.3
	Agree	1	.3	.3	93.6
	strongly agree	23	6.4	6.4	100.0
	Total	360	100.0	100.0	

Source: research survey, 2022

The result of the model indicated that one (3%) respondents strongly dis agree on the lending procedure. 10(2.8 %) of the respondents dis agree on lending procedure of lenders. 15(4.2 %) farmers agree on lending procedure and finally 334 (92.8%) of respondents strongly agree on the lending procedure. The output of the model indicated that the majority of households responded that the lending procedure of institutions were very complicated. However, it does not affect access to formal credit in study area. From the total respondents some respondents were responded that the lending procedures of formal credit institutions were not difficult to get the credit access from formal institutions in the study area. **Deposit interest rate** The above indicated that 151 (41.9 %) the respondents strongly dis agree on deposit interest rate. 84 (23.2 %) of households dis agree on deposit interest rate. 101(4.4 %) of the respondents were neutral. From the total respondent 1 (.3 %) of farmers responded that they were agree on deposit interest rate. The remaining 23 (6.4 %) of the respondents were strongly agree on deposit interest rate. The result of the model indicated that majority of households were a doubt on the deposit interest rate which mean that formal credit institutions were not paid sufficient interest rate on their deposit. Because of This small landholder, farmers were not save their money in formal credit institutions. In the opposite side, some respondents said that deposit interest rate were sufficient. Generally, access to formal credit were influenced by deposit interest rate.

4.1.5. Cross- tabulation between the predictor variables and response variable

Age of households Table 4. 5: Age of respondents and access to formal credit

Category	Were you credit accessed or without credit accessed?		Total
	With credit access	Without access credit	
15-24years	27	5	32
25-54years	70	89	159
55-64years 65-80years	40	45	85
What were your age? above80years	21	57	78
	2	4	6
Total	160	200	360

Source survey 2022

When analyzing the age relationship with access to credit as displayed in table 4.2.1, those households in the bracket from 25 to 54 year were found to be more credit accessed (70 %) than the other age brackets. However, in this cross-tabulation most farmers does not receive credit, this indicated that age were not considered as a determinants of access to formal credit in study area.

Sex of respondents

Table 4.6 Two: Sex of respondents and access to formal credit

Gender status * Was you credit accessed or without credit accessed? Cross tabulation

		Were you credit accessed or without credit accessed?		Total
		withcreditaccess	Withoutcreditacess	
gender status	Male	119	177	296
	Female	41	23	64
Total		160	200	360

Sex access credit (see table 4.2.) shows that male households were slightly more credit accessed than female households (119 male Vs 41 female) when compared to the average (160).

Education level of households

Table 4. 7: Education level of households and access to formal credit

What were your highest education level? * Were you credit accessed or without credit accessed? Cross tabulation

		Were you credit accessed or without credit accessed?		Total
		withcreditaccess	Withoutcreditacess	
What were your highest education level?	unabletoreadandwrite	1	104	105
	adult education	50	39	89
	primary level secondary level	62	40	102
		44	13	57
	Degree and above	3	4	7
Total		160	200	360

The level of access to credit education were as displayed in table 4.2.3 shows that most of small landholder farmers were not credit accessed. That means education does not considered as the determinant of access to formal credit. However, majority farmers of Debrebrhan Zuria woreda were literate.

Collateral

assets (land, house, vehicle, agricultural equipment and furniture and fixtures) as collateral * Were you credit accessed or without credit accessed? Cross tabulation

	Were you credit accessed or without credit accessed?		Total
	withcreditaccess	Withoutcreditacess	
Do you had assets (land, house, vehicle, agricultural equipment and furniture and fixtures) as collateral — Yes	146	38	184
No	14	162	176
Total	160	200	360

a. 0 cells (.0%) had expected count less than 5. The minimum expected count were 77.47. The above table shows that the predictor variable and the response variable as they had spastically significant association at (P-value < 0.05). Majority of households had not credit accessed because of their inability of collateral in their house.

Farm size Table 4. 9: Farm size and access formal to credit

	Were you credit accessed or without credit accessed?		Total
	withcreditaccess	Withoutcreditacess	
lessthan1hectare	26	107	133
What were your farm size in 1-2hectare hectare? 3-4hectare	121	81	202
	13	8	21
4andabove	0	4	4
Total	160	200	360

Source: research survey, 2022

The association of farm size and credit access shows that most of the household had between 1 and 2 hectare. That means access to credit were impossible without land. Because of smallest farm size, farmers were without credit accessed in the study area. Empirical studies mainly focused on assessing the determinants of the amount of credit taken over a fixed period as joint decisions. The distribution of loan were continuous over positive values, as far as none of the farmers can had a negative credit balance. One common approach used to modeling this situation were the Cross tabulation model. However, the decision taken by farmers to demand credit were preceded by the decision to had "access to credit". Thus if there exists any correlation between these two decisions, the Cross tabulation model can no longer properly handle the situation. It might be the case that net farmer's income lowers the probability to access credit. However, if farmers were used to demand credit, net farmer's income might increase the amount of credit. Many empirical studies had rejected the standard Cross tabulation model. The estimated the determinants of credit access and demand by smallholder vegetable farmers in southwest region, using the cross tabulation model. First, the results of the access equation show that education, membership to a farmers' association, extension services and distance to credit source were positives and spastically significant with the probability to access credit by farmers. This implies that as the foregoing factors increase, the probability to have access to credit increase too. Regarding the demand equation, distance, membership of a farmer's associations, extension services and farm size were significant and positively related to the amount of loan borrowed by farmers.

Saving culture Table 4. 10: Saving culture and access to formal credit

	Were you credit accessed or without credit accessed?		Total
	With credit access	Without credit access	
strongly dis agree	58	64	122
do you agree that all Peoples dis agree save their money in formal neutral credit institutions Agree	56	43	99
	0	24	24
	27	30	57
strongly agree	19	39	58
			360
Total	160	200	

Table 4. 11: chi-square test of saving and access to credit

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	53.802[a]	4	
Likelihood Ratio	62.827	4	.000
Linear-by-Linear Association	31.087	1	.000 .000
N of Valid Cases	360		

a. 2 cells (20.0%) had expected count less than 5. The minimum expected count were 4.20.

The association between saving culture and access to formal credit shows that as they had seen in table 4.3.4 there were spastically significant association (at P=<0.05). If farmers were save their money in formal credit institutions, they had get credit accessed and they had an ability to pay their loan on time.

Source of information

Table 4. 12: Information and access to formal credit

enough information about formal credit institutions ,at		Were you credit accessed or without credit accessed?		Total
		withcreditaccess	Withoutcreditacess	
that as you can get the information from radio, phone, internet, extension agents and from other farmers	Strongly disagree	5	0	5
	Dis agree	25	0	25
	Neutral	27	3	30
	Agree	90	158	248
	strongly agree	13	39	52
Total		160	200	360

Source: research survey, 2022

Table 4.12 shows the association between information sources and access to formal credit. Majority of farmers were not information accessed this indicated that information were an important variable in determining access to formal credit.

Tropical livestock unit

Table 4. 13: TLU and access to formal credit

	N	Minimum	Maximum	Mean	Std. Deviation
how long you used credit service from formal credit institutions	360	0	10	1.71	2.173
Valid N (List were)	360				

Source: research survey, 2022

Experience in credit Table 4.14 Experience in credit

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Household savers in the formal credit institutions have the ability repay their loan than non-savers,	360	.00	10.00	2.6111	2.16425	1.018	.129
Valid N (list wise)	360						

Source: research survey, 2022

Experience in credit use from the formal credit institutions were different among the sample households. The number of sample households who had experience with using credit from formal financial institutions were only small. The average years of credit experience of sample households from the formal financial institutions in the study area were 2.6111 years and the maximum and minimum experience were 10 years and 0 year respectively.

A record of your ability to repay debts and demonstrated responsibility in repaying them were very little. Credit is a contractual agreement in which a borrower receives something of value immediately and agrees to pay for it later, usually with interest but most peoples lived in that are needs without credit based on the data were collected.

This variable has positive and statistically significant to determine household's access to formal credit at 1 % significance level. This indicates that the more experienced the households in credit use, the better to get access to formal credit in the study area. The farmers who had relatively long-term relationships with credit institutions were more likely to access such credit easily with compared to relatively new farmers. In case of access to credit from formal sources, farming experience also plays a crucial role because the experienced farmers would have already dealt with banks to access loans several times in the past, so they had a better understanding of the terms, conditions and procedure; hence, the cost incurred on the credit would remain low.

Distance from lending institutions

Table 4. 15: Distance and access to formal credit

You used long credit service from formal credit institutions. * Were you credit accessed or without credit accessed? Cross tabulation

		Were you credit accessed or without credit accessed?		Total
		withcreditaccess	Withoutcreditacess	
	strongly dis agree	18	1	19
you used credit	Dis agree	33	1	34
service from formal credit	Neutral	3	3	6
Institutions.	Agree	55	146	201
	strongly agree	51	49	100
Total		160	200	360

Source: research survey, 2022

The distance in hours that the potential beneficiaries traveled on foot for accessing credit from formal financial institutions were assessed. The majority of household's response shows that

The distance were far from their home. It were considered as the variable that affects households from accessing credit service.

Infrastructure

Table 4. 16: Infrastructure and access to formal credit

There were full infrastructure in our Kebeles * were you credit accessed or without credit accessed? Cross tabulation

Variable	Category	Were you credit accessed or without credit accessed?		Total
		withcreditaccess	Withoutcreditacess s	
	strongly dis agree	57	10	67
	Dis agree	57	106	163
There were full infrastructure in our Kebeles	Neutral Agree strongly	6	19	25
	agree	40	27	67
		0	38	38
Total		160	200	360

Source: research survey, 2022

Majority of households responded that there were no full infrastructure in study area; as a result, households had not a credit access as shown in table 4.3.6 (without access 160 Vs with access 168). However, infrastructure were not considered as the determinants of access to formal credit. That mean whether there infrastructure or not it were the not the major factor. Access to formal credit were not determined by infrastructure in the study area.

Lending procedure

Table 4. 17: Lending procedure and access to forma credit

		Were you credit accessed or without credit accessed?		Total
		withcreditaccess	Withoutcreditaces s	
	strongly dis agree	58	79	137
The lending procedure of formal	dis agree	52	27	79
credit institution were very	neutral	4	11	15
complicated	Agree	46	61	107
	strongly agree	0	22	22
Total		160	200	360

Source: research survey, 2022

From the total respondents some respondents were responded that the lending procedures of formal credit institutions were not difficult to get the credit access from formal institutions in the study area.

Interest rate

Table 4. 18: Interest rate and access to formal credit

variable	Category	Were you credit accessed or without credit accessed?		Total
		Withcreditaccess	Withoutcreditaces s	
getting sufficient interest rate of return for our deposits, The interest rate of ACSI were higher than CBE	strongly dis agree	58	93	151
	dis agree	56	28	84
	Neutral	46	55	101
	Agree	0	1	1
	strongly agree	0	23	23
				360
Total		160	200	

Table 4. 19: Chi-square test of interest rate and access to credit

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	99.984[a]	4	.000
Likelihood Ratio	107.730	4	.000
Linear-by-Linear Association	87.794	1	.000
N of Valid Cases	360		

a. 0 cells (0.0%) had expected count less than 5. The minimum expected count were 0.4.The following table shows that the predictor variable and the response variable as they had spastically significant association at (P-value < 0.05).

4.2. Binary Logistic regression

4.2.1. Model assumptions and data properties

The following diagnostic tests were carried out to insure that the data fit and the basic assumptions of Binary Logistic Regression Methods were presented or cheeked. Logistic regression does not assume a linear relationship between the dependent and independent variables. The dependent variable must be a dichotomy (2 categories). The independent variables need not be interval, nor normally distributed, nor linearly related, nor of equal variance within each group. The categories (groups) must be mutually exclusive and exhaustive; a case can only be in one group and every case must be a member of one of the groups. Larger samples were needed than for linear regression because maximum likelihood coefficients were large sample estimates. 30 cases per predictor were fair and recommended (Sabine & Brian, 2004).

Regarding the dependent variable, as expressed previously, it were a dichotomous variable with two categories. In addition, it were coded as two categories that were helpful to fit with binary Logistic regression method. The study takes access to formal finance as a dependent variable with dummy if the response were yes as 1, 0 otherwise. Therefore, it fulfills the first assumption.

Case Processing Summary: were a summary, which shows the total number of cases observed, missing cases and cases included in analysis (Julie, 2007). Case processing summary were presented in the following table, Table 4.17.

Table 4. 20: Case-processing summary

Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	360	100.0
	Missing Cases	0	.0
	Total	360	100.0
Unselected Cases		0	.0
Total		360	100.0

a. If weight were in effect, see classification table for the total number of cases.

Source: Binary Logistic regression output

The case-processing summary in Table 4.3.9 shows that a total number of cases observed were 360 and of which 360 included in analysis and there were no cases selected as missing cases. When running binary Logistic regression model, if there were missing in a given case in one of the explaining variables or predicted variable then it will be excluded from the overall analysis (Julie, 2007).

Omnibus test of model coefficient:

Gives an overall indication of how well the model performs, over and above the result obtained for Block 0, with none of the predictor enters in to the model. This referred as a _goodness of fit 'test. For This set of result, a highly significant value were necessary (significant value less than 0.05) (Julie, 2007). It presented in the following table, Table 4.310. Table 4. 17: Omnibus tests of model coefficient

Table 4.21 Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
	Step	209.450	1	.000
	Block	209.450	1	.000
Step 1	Model	209.450	1	.000

Source: binary Logistic regression output

Table 4.18 shows that a significant effect of access to finance (LR test: chi square= 387, p

< 0.001).Therefore, the model with the set of variables used as predictors were better than SPSS, original guess shown in the block0, which assumed that everyone would report no access to formal finance.

Hosmer and Lemeshow Goodness of Fit Test: were the most reliable test of model fit available in SPSS and interpreted very differently from the omnibus test. Here poor fit were indicated by a significant value less than 0.05. Therefore, to support a model the value must be greater than 0.05 (Julie, 2007).

Table 4. 22: Hosmer and Lemeshow Test

Step	Chi-square	Df	Sig.
1	4.885	8	.770

Source: Binary Logistic regression output

As presented on Table 4.20 the chi-square value for the Hosmer-Lemeshaw Test were 4.885 with a significant level of 0.77. This value were larger than 0.05, therefore indicating support for the model.

Model summary: gives us another piece of information about the usefulness of the model. The Cox and Snell R square and the Negelkerke R square values provide an indication of the amount of variation in the dependent variable explained by the model (from a minimum value of zero to a maximum of approximately 1) (Julie, 2007).

Table 4.23 Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	285.162a	.441	.591

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Source: Binary Logistic regression output

From Table 4.19, the two values of Cox and Snell R square and the Negelkerke R square were 0.659 and 0.880, suggesting that between 65.6 percent and 88 percent of the variability were explained by the set of variables.

Classification table: provides with an indication of how well the model were able to predict the correct category for each case. There were two predictive values called positive and negative. Positive predictive value were the percentage of cases that were the model classified as having the characteristics that were actually observed in the group. Negative predictive value were the percentage of cases predicted by the model not to have the characteristics that were actually observed not to have the characteristics (Julie, 2007).

Table 4. 24: Classification table

	Observed		Predicted		
			Were you credit accessed or without credit accessed?		Percentage Correct
			withcreditaccess	Withoutcreditacess	
Step 1	Were you credit accessed or withcreditaccess without credit accessed? withoutcreditacess		146	14	91.3
			38	162	81.0
	Overall Percentage				85.6

a. The cut value were .500

Source: Binary Logistic regression output

As presented in Table 4.20, classification table shows misses in classification accuracy, which shows correctly classified and incorrectly classified. There were 146 individuals classified in the model as without access of which 91.3 percent were misclassified as false negative and the remaining 81.0 percent were correctly classified. Similarly from the total 38 individuals classified in the model as there were with credit access for loan 91.3 percent were correctly classified while remaining 81.0 percent were classified as false positive indicating misclassified by the model as there were credit access while actually there were no. Therefore, the overall accuracy of the model were 85.6 percent implying the model can correctly predict the predicted variables, access to formal credit.

Multicollinearity diagnosis: To study determinants of access to formal credit for small landholder farmers, 360 farmers were subjected to Logistic regression analysis. The statistical software used for analyzing the data were SPSS 20.0 for windows. There were two measures were often suggested to test the presence of multicollinearity. These were, variance inflation factor (VIF) for association among the continuous explanatory variables and contingency coefficients for dummy variables Guajarati (2003).

4.3. Binary Logistic Regression Result

In This subtopic the study, investigate the level of relationship and magnitude of explanatory variables over predicted variable based on the Logistic regression model output. Therefore, finally the finding determines which of the explanatory variable were predictive of access to formal credit.

Here the data analyzed were —variable in the equation tableǁ from output of the regression. The variable in the equation table gives information about the contribution or importance of each of a models predictor variable. The test that were used here were known as the Wald test, and the value of the statistics for each predictor in the column labeled Wald. Columns were the variables that contribute significantly to the predictive ability of the model (Julie, 2007).

4.4. Interpretation of Explanatory Variables

Age of households:

In This study, ages of the household head were treated as a categorical variable. It were found that age of the household head does not significantly predict access to formal credit. This shows being younger or older household head does not matter for access to formal credit in study area. This finding disputed the finding of Chinasa & Kelechi (2015) says that the age of farmers were negatively and significantly associated with probability of accessing credit and the result shows that an increase in household age by one year leads to decrease in the probability of farmer's access to credit. It might be because older farmers had larger capital basis not to see for credit. The result were consistent with the result of Muse (2016) and Assogba et al., (2017) who found that age of households head does not significantly predict access to formal financial services.

The Present results were suitable in that, household heads earlier with uses of formal credit determine the value of being old age to apply formal credit. Experiences of household heads developed though time that makes him/her customer of financial institutions in specific formal financial institutions and not the fact that he/she were old in age naturally in the sociopolitical context of the country.

Sex of Respondents : The variable were a Dummy variable and a value of 1 assigned for female and 2 for male. The study also uncovered that sex of the household head were insignificant in determining household's access to formal credit. This were an indicator of improvements in gender discrimination. It may result from because of special treatment given by the millennium development goals and the progressing of microfinance moments in Ethiopia that were part of weapons for women empowerment. However, still the male dummy had an insignificant negative coefficient, which shows that the negligible benefit of male-headed households in reducing the probability of being credit constrained. This result were consistent with results of Tilahun (2015) who found that genders of household heads were insignificant with negative

Coefficients. This finding disputed with the finding of (Kaino, 2005) and that of (Sebopetji & Belete, 2009).

Education level of households : Education levels of households were treated as a categorical variable. In the study as shown in the model of the above table 4.1, education level of households become insignificant to predict household's level of access to formal credit. However, This finding contradicts with the hypothesis of the researcher that had claimed positive effect of household's education for access to formal credit. Moreover, Muse (2016), argues that whether households educated or not it does not matter in determining access to formal credit.

Generally, this study reveals that education had an insignificant influence on access to formal credit. This finding disputed with the finding of Dzadze et al. (2012) level of education influences a farmer's chances of accessing credit. This were because higher level of education were associated with the ability to access and comprehend information on credit terms and conditions, and ability to complete loan application forms properly.

Collateral: The study found that collateral had positive and spastically significant influence on access to formal credit of p (0.000) at 1 % of probability level. The coefficient of estimation result shows that if a borrower had collateral, small landholders can access formal credit service. Because, small landholder farmers had ability to repay their loan on time, if borrowers were fail to repay their loan there were an assurance to lenders. The finding of this study were consistent with the finding of (Assogba et al, 2017; (Samuel, 2020). Collateral means farm households were expected to have social collateral, which were practiced in group borrowing as well as individual borrowing methods as a requirement to access credit in microfinance institutions and commercial banks.

Farm size in hectare: Farm sizes of households in this study can understood as the total cultivated land size under the control of particular households measured in terms of hectare. According to the model output, farm size were insignificant relationship with access to formal credit by small

Landholder farmers. This variable were associated with the age of households. The older the small landholder farmer becomes, the more experience gained the credit access.

Saving culture: As expected, the saving variable were positive and spastically significance influence with access to formal credit. The higher the households saving, the more the household savers to repay their loan and the more likely that credit institutions lend to those savers. The

output of the model shows that saving were significance (P=0.000) at 1% probability level in the study area. The output indicated that the small landholder farmers saving culture were highly important and were a precondition for credit access and farmers were able to repay their loan on time in study area. The output indicated that the probability of access to formal credit were increased by farmers saving habit with related to their ability to repay their loan. The result of the study were consistent with the result of Baiyegunhi et al. (2014) and Samuel (2020). When farmers save higher amount of money it leads to an increase the ability to repay their credit to financial institutions it could be substituted as collateral in providing credit.

Information: The model output stated that access of information (INFORM) had positively and significantly determined the household's access to formal credit at 10% probability level. The finding shows that the small landholder farmer who got information about lending institutions from different sources were more likely access the credit possibility than those who do not have. These were because informed households were knows more about credit requirements, rules and regulations of credit access. The result of the study indicated if, small landholder farmers had strong culture of using available source of information like radio wave and Televisions as a source of information on the socio political conditions of His/her locality and nationwide, their likelihood to use formal credit increases more due to the effects of media teaching. The result were disputed with (Muse, 2016).

Livestock ownership: The result of binary logit model shows that total livestock ownership owned by farmers in the form of tropical livestock unit (TLU) found to have a negative and spastically significant at (10%) relationship with access to formal credit. A unit increases in total livestock decreases the probability of farmer's access to formal credit. Because, livestock were an asset of farmers that can liquidate at the time of cropping season to purchase agricultural inputs thereby reducing their need of credit. In addition, Number of livestock in tropical livestock unit in rural areas takes as an accumulation of wealth, security during emergency case. They can also exchange into cash when the demand rises. As a result, it hypothesized that a negative relationship with the dependent variable by justifying, when the total number of animals of household increases, the household would be less likely to go for credit. The result of the model also shows that the variable had a negative relationship that farmer with lesser number of animals uses formal credit service than larger animals. The result were consistent with the result of (Gebeyehu et al., 2019) and that of (Sareay, 2008).

Experience in credit use: This variable had positive and statically significant to determine household's access to formal credit at 1 % significance level. This indicates that the more experienced the households in credit use, the better to get access to formal credit in the study area. The farmers who had relatively long-term relationships with credit institutions were more likely to access such credit easily with compared to relatively new farmers. In case of access to credit from formal sources, farming experience also plays a crucial role because the experienced farmers would had already dealt with banks to access loans several times in the past, so they had a better understanding of the terms, conditions and procedure; hence, the cost incurred on the credit would remain low. This result were consistent with the result of Nouman, Siddiqi, Asim, and Hussain (2013), Oboh and Ekpebu (2011), saqib et al. (2018), and Sebopetji and Belete (2009) who all reported a positive relationship between access to agricultural credit and farming experience. Similarly, Yehuala (2008) also revealed that farmers with greater farming experience had a much better association with cooperatives and other formal sources of credit like formal banks and nongovernmental organizations. Based on the output of the model most of the respondents had 1 year to 5 years.

Distance The distance to credit source were insignificant impact on access to formal credit. Access to formal credit were not determined by its distance rather it determined by household collateral and number of households livestock in the study area. The result of the This study were different from the result of Kiplimo et al. (2015) who found that farmers tend to discouraged borrow from formal credit institutions when credit sources were located further away from their farming operations. Additionally, Johnson and Morduch (2007) shows that those farming households who lives newer to the credit source had positive effect on credit access.

Infrastructure: Access to infrastructure among households living in Debrebrhan   Zuria woreda does not bring significant effect on access to formal credit. The result of current study implies that, access to infrastructure were important for the safe transport of households from their kebele to their market center of the woreda. Otherwise, access to infrastructure does not determine household level usage of formal credit services. So, access of infrastructure can used as for the fulfillments of financial request from formal credit institutions located in town area and do not directly determine access to formal credit in the study area.

Lending procedure: Lending procedures were among the independent variables tested as a determinant of smallholder farmers 'access to credit. To get credit from formal credit institutions,

farmers were expected to pass different steps. From those steps, some were applying for credit, recruited by peasant association screening, committee and finally group formation. However, based on the result of the model from the total respondents most of them were responded that the lending procedure were not difficult and were not a constraint to access credit. That means formal credit institutions had convenience time for their clients

Interest rate: Interest rate were an amount of money paid to depositors at the time of withdrawal from formal credit institutions. The relationship between deposit interest rate and access to formal credit for farmers from formal credit institutions conforms to a prior expectation of the study. That were, the higher deposit interest rate by financial institutions, the higher the volume of credit source by farmers and vice versa. The output of the model shows that deposit interest rate were statically significant and positive signs with access to formal credit at ($P=<0.05$). The reason were that, when deposit interest rate increases to farmers saving culture of farmers also increased This leads an increase the probability of access to formal credit.

Constraints of Small Landholder Farmer's Uses of Credit Access from Microfinance Institution and Commercial Banks

✓ Concerning with the question to household about why you do not use credit access from commercial bank of Ethiopia majority of sampled farmers indicates there were the problem of collateral needed by commercial bank for credit security. Some of the respondents responded that lack of information about formal credit institutions. In reality, most of small landholder

✓ Farmers lack of required collateral of commercial bank of Ethiopia.

✓ During the time of interview with the manager of microfinance institution weak institutional saving mobilizations, absence of agents lower in the kebeles Level and lack of combination with local governmental administrative were the major problems of household level uses of

✓ Saving products study area.

Requirements of Amhara credit and saving institutions from farmers

✓ Access to formal credit for small landholder farmers were easy to implement in Amhara credit and saving institution-using land as collateral like vegetable farm.

✓ Small landholder farmers were borrowed from Amhara credit and saving institution up to 50,000 in birr.

The main requirements were

✓ First of all farmers must open an account book from Amhara credit and saving institution Identification card from their kebeles

✓ If farmers were married, it needs the agreements of both husband and His wife.

✓ Perception of farmers like repaid their loan or not and farmers strength and weakness should be checked

✓ Farmers should purchase life insurance. However, now a day's access to formal credit were weak as a result of different factors. To improve access to formal credit; there should be peace in the countries;

✓ There should be market stability because farmers were borrowed at the time of summer season so, to get credit and to pay credit back market stability were the most important factor.

Requirements of Commercial Bank of Ethiopia

✓ The applicant shall present landholding certificates and current year land rent payment receipt;

✓ The applicant shall had a minimum of 2 hectares of land but more than 29 hectare;

✓ Registration certificate from regional or national cooperative agency;

✓ Minutes of resolution on the financing requested passed by at least three-fourths of attendees of the general assembly or as per memorandum and/or articles of association;

✓ If the financing request were for purchase of tractor, combine harvesters or other heavy agricultural machineries, the applicant shall submit confirmation letter from woreda or zonor region on or ministry of agriculture, which assures suitability of the area for merchandiation.

✓ The applicant shall had present a business plan which shows financial viability and repayment capacity of the business;

✓ The applicant shall make equity contribution of at least 30% of the purchase value of the

✓ Agricultural machinery solely in cash.

CHAPTER - FIVE:

Conclusion and recommendation

Introduction

This chapter precisely presented the findings of the study and main recommendations of the researcher for concerned bodies.

5.1. Conclusion

In This section the researcher were concluded based on objective of the study result of the study indicated that 53 % of small landholder farmers in the review woreda did not had access to formal credit. This shows that small landholder farmers in the study area may not be adequately financed or do not had adequate collateral given the low level of credit access.

The first objective of this study focuses on identifying the demographic characteristics of farmers like age, sex and education had no significant influence on access to formal credit. This were as a result of access to formal credit were determined by households experience in credit use.

Socio-economic factors like collateral, farm size in hectare, saving culture, source of information, livestock ownership, experience in credit use, distance from lending institution and infrastructure were variables, which were presumed to have an impact on access to formal credit. The binary logit estimate indicated that collateral, saving culture, source of information and experience in credit use significantly influence access to formal credit in study area. Livestock ownership in terms of tropical livestock unit had negative influence on access to formal credit.

From institutional characteristics of lenders, deposit interest rate had significant positive impact on access to formal credit. However, lending procedure had no influence on access to formal credit.

To achieve this objective, thirteen hypotheses were developed. To test hypothesis and to achieve the intended research objective, the study applied qualitative and quantitative research approach and explanatory research design. The analysis were performed using cross-sectional data derived from small landholder farmer's interview in Debrebrhan   Zuria woreda.

The sample of this study were included 360 credit users and non- user small landholder farmers in Debrebrhan   District. Multi-stage sampling technique were used to select three hundred sixty

small landholder farmers in study area from the total population. Diagnosis tests, descriptive statistics, contingency coefficient and regression analysis were employed for this study. Access to formal credit considered as dependent variable that were measured credit user and non-user of farmers. While, age, sex, education, collateral, farm size, saving, information, livestock, experience in credit use, distance, infrastructure, lending procedure and deposit interest rate were taken as independent variable. Binary Logistic regression model were applied to estimate the parameters of model. The result of study showed that six explanatory variables found to be significant at 10 % and <0.05 % level of significance.

Among thirteen explanatory variables, livestock had negative and statically significant effect on access to formal credit at 10 % significance level. While, collateral, saving culture, source of information, experience in credit use and interest deposit interest rate had positive and statically significant effect on access to formal credit at 10% and <5 % significance.

5.2. Recommendation

In Debrebrhan District, access to formal credit for farmers were the major concern related to higher expansion of agriculture and reduction of poverty. The analysis of the study indicated that access to formal credit had positive impact on farmer's living standards. Based on the finding of the study the researcher provided the following recommendations.

For Microfinance Institutions (MFIS)

MFIS should find a method of source of information for farmers **for commercial bank of Ethiopia**

CBE should open branches in rural increasing deposit interest rate. Area and promote farmers to save their money in banks by by counting of farmers wealth CBE facilitate credit service for farmers

- ✓ CBE now just focus on big customers rather than agricultural-sector customers, so commercial activity. Banks had   widely reach out to small landholder farmers with their benefits from farming

- ✓ CBE should consider farmers land what they had used currently as collateral. That means Estimate animals of small landholder farmers in terms of birr or fixed assets

  For small landholder farmers.

✓ In order to increase small landholder farm households to overcome their drawback;   r's
   access to credit, it requires more effort from

✓ Creating close relationship with credit sources to get enough information

✓ In case of collateral, the researcher recommended that the household heads or the respondents form a group to obtain loan or credit from banks and microfinances. It means group lending were considered as collateral

✓ Small landholder farmers need to find new information about not only financial institutions but also everything related to their countries economy.

5.3. Suggestions for Further Research

This study were limited to determinants of access to formal credit with socio-economic and institutional variables and did not include macro- economic variables like inflation and gross domestic product in Ethiopian context. It would be expected that access to credit be extremely affected by those variable. Therefore, it were better to study by further researchers.

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Appendix

Conversion factor to estimate tropical livestock unit

Species of animals	TLU
Calf	0.25
Cow & Ox	1
Sheep & Goats (Young)	0.06
Sheep & Goats (adult)	0.13
Horse	1.10
Donkey (Adult)	0.70
Donkey (Young)	0.35
Chicken	0.013

Source: storck et al., (1991

Appendix I

Questionnaires Filled By Small Landholder Farmers

ST, MARRY UNIVERSITY

SCHOOL OF GRADUATE STUDIES

COLLEGE OF BUSINESS AND ECONOMICS
DEPARTMENT OF ACCOUNTING AND FINANCE

Questionnaire on Access to Formal Credit to Small Land Holders

Dear respondents, this were Yosef Edegie Fentew. I am a master's student and I am doing my research as a partial fulfillment of my degree in accounting and finance department, St, marry university. The purpose of this questionnaire were to collect information on the **determinants of access to formal credit to small landholders** in Debrebrhan   Zuria district. I want to assure you that this information will be used for academic purpose and your identity will not be dwereclosed to anybody. In addition, the information you were providing were kept confidential and used or transferred to a third party without your consent.

Hence, I kindly request you to take a few minutes and fill and return this questionnaire to me and you need not write your name. I want to thank you in advance for your cooperation.

Instructions

I.   Read each question cisfully and put your answer by tick (√) sign inside the boxes and cells in the table corresponding to the response that most accurately represents your views and/or level of agreement.

II.   Please put your answer in the provided box only.

III.   No need of writing your name.

Section I: Individual Characteristics of Farmers

(1) What were the name of your kebele? _____

(2) If you live in a rural kebele, what were its distance from the nearest town in Kms? _____

1.   between 15- 24 years

☐

2. between 25 – 54 years

☐

3. between 55 – 64 years

☐

4. above 65 years

☐

(4) Sex

1. Male ☐   2. Female ☐

(5) What were your highest education level?

1. unable to rea and write

☐ ☐

2. Adult education

3. Primary level ☐

4. Secondary level ☐

5. Other specify --------

(6) What were your farm size in hectare?

1. Less than 1 hectare

2. Between 1 and 2 hectares

3. 2 and above

Section II: Access to Formal Credit

(7) Were you credit accessed or without credit accessed?

1. Credit accessed   2.   Without credit accessed

(8) If your answer were ―Yes} to question seven, how long you used credit service from formal credit institutions? ---------------------------------

Please indicate your level of agreement for the following statements by putting a tick mark (√) in the appropriate column containing Strongly Dis agree, Dis agree, Neutral, Agree and Strongly Agree.

Statement	Level of Agreement to Statements				
	Strongly Agree	**Agree**	**Neutral**	**Dis agree**	**Dis agree**
1) Currently I get sufficient credit services from formal lending institutions					
2) I obtain credit service from ACSI for the purpose of purchase of fertilizer & seeds, farm equipment, food, livestock, household goods and for debt payments					
3) I obtained credit service from CBE for the purpose of purchase of fertilizer & seeds, farm equipment, food, livestock, household goods and for debt payments					

Section III: Socio- Economic Characteristics of Farmers (√)

Statement	Level of Agreement to Statements				
	Strongly agree	Agree	Neutral	Dis agree	Strongly Dis agree
1) you had assets (land, house, vehicle, agricultural equipment and furniture and fixtures) as collateral					
2) Formal credit institutions were very worried about collateral in accessing credit					

3) do you agree that all Peoples save their money in formal credit institutions					
4) Household savers in the formal credit institutions had the ability repay their loan than non-savers					
5) at how much degree you were agree as you continue to save after repaying your loan					
6) I had enough information about formal credit institutions					
7) at how much degree you were agree that as you can get the information from radio, phone, internet, extension agents and from other farmers					
8) The lending institutions were very far from our home					
9) We had rural road that connects our kebele with woreda					
10) There were full infrastructure in our Kebeles					

Total number of in animals in TLU

Species of livestock	Number owned	Purpose
Ox		
Cow		
Calf		
Horse		
Donkey		
Goat		
Sheep		
Chicken		

Section IV: Institutional Characteristics (√)

Statement	Level of Agreement to Statements				
	Strongly agree	**Agree**	**Neutral**	**Dis agree**	**Strongly dis agree**
1) The lending procedure of formal credit institution were very complicated					
2) Formal credit institutions had convenience working time of repayment for their clients					
3) Formal credit institutions had an ability to prepare an application letter and filling different formats					
4) There were working ethics and efficiency of officials in formal credit institutions					
5) We were getting sufficient interest rate of return for our deposits					
6) The interest rate of ACSI were higher than CBE					

ST MARRY UNIVERSITY
SCHOOL OF GRADUATE STUDIES
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DEPARTMENT OF ACCOUNTING AND FINANCE

Interview Guide on Access to Formal Credit to Small Land Holders

Personal interview for Microfinance and Bank managers

Dear Sir/Madam,

My name were Yosef Edegie Fentew, a student at STMARRY UNIVERSITY Department of accounting and Finance.

Currently, I am conducting a study as a partial fulfillment of the requirement for my master's

Degree. This were being conducting in order to assess the determinant factors affecting loan Portfolio quality in Micro finance institutions.

The information obtained from this session were kept confidential and used only for research Purpose.

1. What do you say about access to formal credit for small landholder farmers from formal?

Credit institutions you lead or manage with?

2. What were procedural requirements should fulfill by farmers to access credit services from your Institutions?

3. Does small landholder farmer's use saving/deposit service from micro finance institutions in The area?

4. What were the constraints that the banks/financial institution had been facing in relation to?

Delivery of credit services for farmers.

5. How do you organize small landholder farmers to save in your institutions?

6. Give any comment or suggestions on how to improve access to formal credit for small land Holder farmers --- --------------

Appendix II

Binary Logistic Regression Result

Classification Table[a,b]

	Observed		Predicted		
			Were you credit accessed or without credit accessed?		Percentage Correct
			withcreditaccess	withoutcreditacess	
Step 0	Were you credit accessed or without credit accessed?	Withcreditaccess	0	160	.0
		withoutcreditacess	0	200	100.0
	Overall Percentage				55.6

A. Constant were included in the model.

b. The cut value were .500

Variables in the Equation

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 0	Constant	.223	.106	4.426	1	.035	1.250

Variables not in the Equation

		Score	Df	Sig.
	Variables Lending procedure	5.934	1	.015
Step 0	Overall Statistics	5.934	1	.015

Block 1: Method = Enter

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	488.631[a]	.016	.022

a. Estimation terminated at iteration number 3 because

parameter estimates changed by less than .001.

Classification Table[a]

	Observed		Predicted		
			Were you credit accessed or without credit accessed?		Percentage Correct
			withcreditaccess	withoutcreditacess	
	Were you credit accessed or without credit accessed?	Withcreditaccess withoutcreditacess	58	102	36.3
			79	121	60.5
Step 1	Overall Percentage				49.7

a. The cut value were .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	lending procedure	.187	.077	5.880	1	.015	1.205
	Constant	-.228	.213	1.148	1	.284	.796

a. Variable(s) entered on step 1: lending procedure.

One-Sample Test

	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
				Test Value = 0	Lower	Upper
If you live in a rural kebele, what were its distance from the nearest town in Kms?	45.171	359	.000	2.95556	2.8269	3.0842
What were your highest education level?	40.126	359	.000	2.367	2.25	2.48
What were your farm size in hectare?	51.997	359	.000	1.71111	1.6464	1.7758
Total number of in animals in TLU	14.789	359	.000	12.53889	10.8715	14.2063
Household savers in the formal credit institutions had the ability repay their loan than non-savers, at how much degree you were agree as you continue to save after repaying your loan	22.891	359	.000	2.61111	2.3868	2.8354
We were getting sufficient interest rate of return for our deposits, The interest rate of ACSI were higher than CBE	34.435	359	.000	$2.058	$1.94	$2.18
What were your age?	51.297	359	.000	2.63056	2.5297	2.7314

Sorce data out put binary regression result 2022