



**DOES USE OF CREDIT IMPROVE WELFARE OUTCOMES
OF HOUSEHOLDS'? THE EMPIRICAL CASE STUDY IN
ETHIOPIA**

M.Sc Thesis

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ETHIOPIA**

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**A thesis submitted to the school of Graduate Studies of Addis Ababa
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for the Degree of Master of Science in Development Economics**

ADDIS ABABA, ETHIOPIA

JANUARY 2021

DECLARATION

I Dereje Getye I.D. number GSE/4258/10, the undersigned; hereby affirm that the work enclosed in this thesis is my original work and that I have not formerly in its whole or in part submitted at any university for a degree.

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ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE
MSc GRADUATE PROGRAM IN DEVELOPMENT
ECONOMICS

This is to endorse that the thesis prepared by Dereje Getye, entitled: Does access to Credit improve the Welfare of households'? An empirical case study in Ethiopia submitted in partial fulfilment of the requirements for the Degree of Master of Science in Development Economics complies with the regulations of the University and meets the accepted standards concerning originality and quality.

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Chair of Department of Graduate Program Coordinator

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ACRONYMS

CSA	-	Central Statistics Agency
GDP	-	Gross Domestic Product
WB	-	World Bank
LSMS	-	Living Standards Measurement Study
NGOs	-	Non Governmental Organizations
CBE	-	Commercial Bank of Ethiopia
DBE	-	Development Bank of Ethiopia
NBE	-	National Bank of Ethiopia
MFIs	-	Micro Finance Institutions
ESS	-	Ethiopian Socioeconomic Survey
NFEs	-	Non-Farm Enterprises
OLS	-	Ordinary Least Square
ESR	-	Endogenous Switching Regression
ATT	-	Average Treatment on Treated
ATU	-	Average Treatment on Untreated
SNNP	-	Southern Nations, Nationalities, and Peoples of Ethiopia
TLU	-	Total Livestock Units

ABSTRACT

At this time financing is one of the most powerful tools for fighting poverty primarily by providing loan to the poor section of the society. The number of formal and informal financial institutions serving the poor in Ethiopia has grown with in short period of time .The constant growth in the sector has created a competition for scarce financing among institutions. Hence, recent years have seen a growing push to investigate the demand of finance and the access of credit especially for the rural households. In light of this, the study analyzed and investigated the determinants of credit and the impact of credit use on the improvements of welfare outcomes in Ethiopia. Probit model was adopted for the selection model and Linear Regression was used from the selection model to calculate the total and average food consumption and total expenditures of households. Results are based on data from the secondary sources and a sample of 2676 households. Descriptive statistics and Endogenous Switching Regression estimation were used for the outcome equation to estimate the impact of credit on households' welfare. The analysis revealed that access to extension service, total livestock holding, availability of family labor force, participating in Non-farm Enterprises, and gender of the household head are important determinants for taking credit. The analysis further revealed that access to credit has positively and significantly associated with the improvements of households' welfare outcomes. Finally, based on both descriptive and econometric results, improving rural farm households' access to extension service, sizing Non-farm Enterprises and livestock sector, are likely to improve welfare outcomes like food consumption and total per capita annual consumption.

Keywords: *Credit; Welfare; Endogenous Switching Regression Model; User; Non-user, Food Expenditure; Total consumption; Ethiopia*

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Ethiopia is one of the Sub-Saharan African countries which liberalize its economy to maintain in all sectors a sustained economic growth and reduce poverty. Over the last ten years the sustainable economic growth brought with it positive trends in reducing poverty in urban and rural areas: While 38.7% of Ethiopian lived in absolute poverty in 2004/05. However, five years later this was declining to 29.6% in 2010/11. Moreover, poverty head count is still more prevalent in rural 30.4 percent than urban areas 25.7 percent in Ethiopia (CSA, 2010/11).

Credit enhances nutrition intake, health condition, savings, asset accumulation, food security, education, women's empowerment, housing, job creation, reduce poverty occurrence, and enhance social solidity. Based on their findings, access to credit has an indirect effect on household wellbeing. It is established that access to credit increases the capacity of farmers to purchase improved agricultural inputs such as fertilizer, improved seed, and agrochemicals, which increase agricultural productivity (Hossain and Knight, 2008 and Khandker and Samad, 2013).

Awotide et al. (2015) pointed out that lack of agricultural credit is one of the main reasons for low productivity in addition to traditional agricultural practices and implements; low inputs and lack of effective extension services; over-grazing by a very large livestock herd; severe soil erosion and depletion of soil fertility; lack of adaptive research; inadequacy and; deficient communication infrastructure; ecological imbalance; inappropriate agricultural policies; poor market integration; political instability; the low level of technological development; etc.

Farmers in rural areas, especially in developing countries still find it troublesome to obtain credit to extend their productions. The challenge of increasing reserves will lead to a decline in output in poor countries, the impact on GDP, and the uncertainty of national food insecurity. Subsequently, access to credit display was considered a key figure for financial development, especially for low-income families. The developing country's farmers living in rural areas have limited access to credit to enhance their productivity. The complexity in raising funds will lead to a decline in output, which intern affects GDP and national food insecurity in poor countries.

Therefore, access to credit is perceived to be an imperative factor in economic development, especially for low-income households (Awotide .et .al. (2015)).

Agricultural production accounts major share of job opportunities for the rural population. However, because of the nature of the rural credit markets and the lending procedures, household access to credit remains a difficult task in rural areas. Informal and formal markets are observed to commonly exist in developing nations. Due to the imperfection of the formal credit market, formal lenders are quite restricted to situations where the informal credit sources are likely to be dominant in rural areas. Poor and low-income households are often because do not have enough collateral, so cannot borrow based on their income (Islam and Maitra, 2012).

Access to credit affects household welfare outcomes. During the planting and vegetative growth of crops, agricultural inputs and expenditures for food and essential non-food items will occur, and only a few months later can the crops be harvested in return. During the planting season, most farmers have negative cash flows. Therefore, to finance the purchase of necessary consumption and production inputs, farmers must either invest in their savings or obtain credit. Therefore, access to credit can greatly improve the ability of poor households with little or no savings to obtain agricultural inputs. Besides, the release of credit to ease potential capital constraints reduces the opportunity cost of capital-intensive assets relative to household labor, encouraging the adoption of labor-saving and higher-yielding technologies, thereby increasing land and labor productivity. This is an important key factor of labor productivity. Encourage development, especially in many African countries (Zeller et al. 1997).

Based on the above considerations, the limited access to formal rural credit, the purpose of this study is to provide a general view of the important characteristics of the rural credit market and the determinants of access to household rural credit opportunities. In particular, this review analyzes the previous literature from a descriptive perspective, summarizes and compares the determinants of rural credit in developing countries. This analysis may help researchers clarify the characteristics of the rural credit market in a particular research location and the determinants of rural credit accessibility.

This study tried to analyze how access to credit improves households' welfare in Ethiopia. The

study used nationally representative and comprehensive data from the third wave of the Ethiopian Socioeconomic Survey conducted on 2015/16 conducted by CSA and World Bank. The welfare of the household is handled by food security status, which is represented by the number of meals per day adult household members consumed, and poverty or total per capita consumption is represented by per capita household consumption expenditure. By using survey data from 2676 sample households in Ethiopia, this study applied an endogenous switching regression approach to detect the impact of credit access on food security and per capita total annual consumption, since the model is believed to be appropriate in avoiding the potential biases in estimating endogenously determined outcome variables.

The endogenous conversion regression model is used to estimate the impact of credit constraints on household welfare. The reason for switching the regression model is that in each period, the probability of households being bound by credit is not zero. This probability varies based on household characteristics, and it is only possible to achieve one of these probabilities in a period (Maddala, 1986) and the model can solve problem of endogeneity by both observable and unobservable characteristics (Takuya H. 2020).

1.2. Statement of the Problem

Access to credit has gradually more considered as an essential instrument for increasing the incomes of the household, mainly by mobilizing resources to more productive uses. The development of local small industries into viable production outfits seems to be the only way out of industrial backwardness, unemployment, and mass poverty (Atieno R. 2001).

The majority of rural entrepreneurs in small scale industries have not benefited from most formal credit institutions. Whereas the informal credit institutions tend to meet some of their credit demand, but as small and micro-enterprise expand in size, the characteristics of loans they require become increasingly difficult for informal credit sources to satisfy, yet they remain too small for the formal lenders (Aryeetey, 1996).

Policymakers have long believed that poor families in developing countries lack obtain appropriate financial services, and thus cannot effectively transfer resources across periods and respond to risks. The reason is that in the absence of a well-functioning financial market, the productivity and living standards of poor families do not have any prospects for growth in any

significant and sustainable way. Besides, traditional commercial banks are usually not interested in lending to poor rural households because of their lack of viable collateral and the high transaction costs associated with small loans suitable for them (Aliou Diagne, Manfred Zeller, and Manohar Sharma, 2000).

As in many countries in Sub-Saharan Africa the formal financial system services only a small minority of enterprises and households (Isern, Agbakoba, Flaming, Mantilla, Pellegrini and Tarazi, 2009). Thus, poor households and SMEs are constrained from accessing formal credit in Ethiopia, and such has serious implications on the welfare and economic growth of the country.

Credit has become increasingly accepted as a powerful instrument to lift the rural poor out of miserable poverty. It also enables households to invest in land improvement to adopt new agricultural technologies, such as high-yielding seeds and fertilizers, to increase their efficiency and income (Zeller & Sharma, 2000). Credit improves the welfare of rural households by raising funds for consumption, reducing the opportunity cost of high-value assets, and using labor-saving technologies (Zeller et al., 1997). Besides, credit helps ensure that the rural poor are protected from shocks (floods, droughts, etc.) by reducing the cost for households to deal with these shocks. In the past credit analysis, the scale of credit rationing in the formal credit market was overestimated due to the neglect of the exploration of factors that may affect credit demand (Kochar, 1997).

Although much research has been done on the relationship between household economic well-being/welfare and access to finance, research methods and procedures were not complete. The basic problems of credit impact assessment study are the endogeneity of credit and sample selection bias problems. Besides, the systematic analysis of the access of credit and its impact on welfare improvement has been scarce. Some of the studies have also a small area coverage and small sample which might not be helpful to reach on conclusion on the impacts of credit access on households' welfare at the national level.

The majorities of the peoples of Ethiopia were and are still scraping through life by subsistence means of life. Even worse, as the size of the country's population continuously increases, the per capita income is not satisfactory, as a result of which the people have reached a stage

where they could even barely make it through life. On the other hand, the number of formal and informal financial institutions serving the poor in Ethiopia has grown within a short period of time. The constant growth in the sector has created a competition for scarce financing among institutions. Hence, recent years have seen a growing push to investigate the demand of finance and the access of credit especially for the rural households. Why have consecutive Ethiopian governments failed miserably in providing the most basic needs of all—food? In general, why is the government of Ethiopia not meeting the demand of credit? What needs to be done? Is there any hope to satisfy the demand of credit especially for the poor households?

Additionally, some studies failed to establish an adequate counterfactual situation and identify the true causality of change. Indeed, to review the effect of credit access, a potential researcher better be able to review the condition would be like if the households have not taken credit, i.e., the situation of counterfactual effect. This research is designed to contribute to the literature on the impact of credit use, as measured by credit from banks and other financial institutions, on household welfare in Ethiopia.

The research is, therefore, designed to facilitate recognizing the impact assessment of how credit improves the welfare of households in Ethiopia and address the factor that affects credit access which increases households' welfare by increasing land productivity. The relevance of credit in economic growth has been emphasized powerfully by plenty of researchers (*Patrick Honohan 2004; Zeller, M.; Diagne, A.; Mataya 1998; Khandker, S.; Faruque, R 1999; and Di Falco, S.; Chavas, J 2009*). All these authors have concluded that credit helps to bring the requested productivity, bring farmers to live for better and food self-sufficiency through the adoption of new and improved technologies.

Therefore, this study is aimed at primarily identifying, analyzing, and documenting the impact of credit use to improve welfare outcomes that contributes its part to the existing body of knowledge. Secondly, it provides a base for policy makers and gives directions for further research, agricultural credit extension and development schemes that will benefit the scheme beneficiaries.

1.3. Research Objectives

1.3.1 General Objective

The ultimate objective of this study was to assess the impact of credit use on improvement of household welfare outcomes in Ethiopia, and through that make recommendations to improve the effectiveness of interventions.

1.3.2 Specific Objectives

- I. Determine households' socioeconomic characteristics that determine access to credit in Ethiopia and
- II. Analyze the effect of access to credit on household welfare outcomes such as expenditure and food security in Ethiopia.

1.4 Research Question

The following research questions were considered:

- I. What are the different factors that determine access to credit?
- II. What are the different factors that affect households to being credit constrained or not?
- III. What is the impact of credit access to improve households' welfare?

1.5 Hypotheses

The hypotheses of this study are:

- I. Access to credit in Ethiopia is not influenced by the household socio-economic characteristics;
- II. Access to credit does not significantly impact the welfare of households in Ethiopia.

1.6 Significance of the Research

The main aim of the paper is to investigate the effect of access to credit on households' welfare outcomes such as expenditure and food security and analyzing households' socioeconomic characteristics that determine access to credit that help to enhance the efficiency and effectiveness of Credit loan to increase the productivity and improved live standard of the households and it, in turn, help credit finance institutions to revise their credit policy and it has

policy implication for concerned governmental organ. The enhanced bank credit access promotes the growth of microenterprises thereby creating employment opportunities, increasing household incomes, and contributing to poverty reduction in line with the indigenous economy of Ethiopia. In addition to this, the paper will contribute to other researchers as an input who wants to do further study on this topic.

There is a need for empirical research on access to credit and the impacts of credit restriction on households' welfare to make continuous information that would use as an instrument for policymakers in their pursuit to improve households' welfare, decline level of poverty and accomplish the main objective of the government by improving the living standards of the rural households.

1.7 Scope of the Study

For this research, the researcher has used nationally representative data of the third wave of Ethiopian Socio-Economic Survey of 2015/16, collected by CSA of Ethiopia in a group effort with the World Bank Living Standards Measurement Study (LSMS team as part of the Integrated Surveys on Agriculture program.

In terms of content scope, the research is undertaken to assess the impact of credit on welfare effect; in terms of household expenditure and food security.

1.8 Limitations of the Study

This study is undertaken to evaluate the gathered data effectively and maintain the scope within a stipulated time and financial limit, it emphasized on a limited number of households (2676 HHs) and determinants of credit and its effect on household welfare outcomes only without taking into account other dimensions of welfare outcomes improvements like saving, agricultural technologies, improves seeds, and others. Household survey by itself is complex and to get reliable data especially on household land holding, volume of production, income, number of livestock as well as other variables which have close economic and social implications are not always free from error.

The other limitation of different empirical reviews is that the coverage of partial households and partial places and regions were under contemplation and generalizes to the remaining poor

households in Ethiopia. Therefore, it needs to balance the empirical findings of this research with comparable research studies in another region to widen the scope of this study.

1.9 Organization of the Thesis

The rest of this Research paper is organized as follows. The second chapter deals with different theoretical and empirical literature that reviewed the topic under consideration. Chapter three deals with the research methodology and the fourth chapter deals with Empirical results and Analysis, Chapter five deals with Conclusion based on the findings.

CHAPTER TWO

2. REVIEW OF LITERATURE

2.1. Concepts and Definitions

In the financial sector, the terms "rural credit", "agricultural credit" and "microfinance" overlap.

Rural credit refers to credit services in rural areas of all income classes.

Agricultural credit may provide funds for agriculture-related activities. In Figure 1, urban agriculture is part of agricultural credit, while rural areas do not.

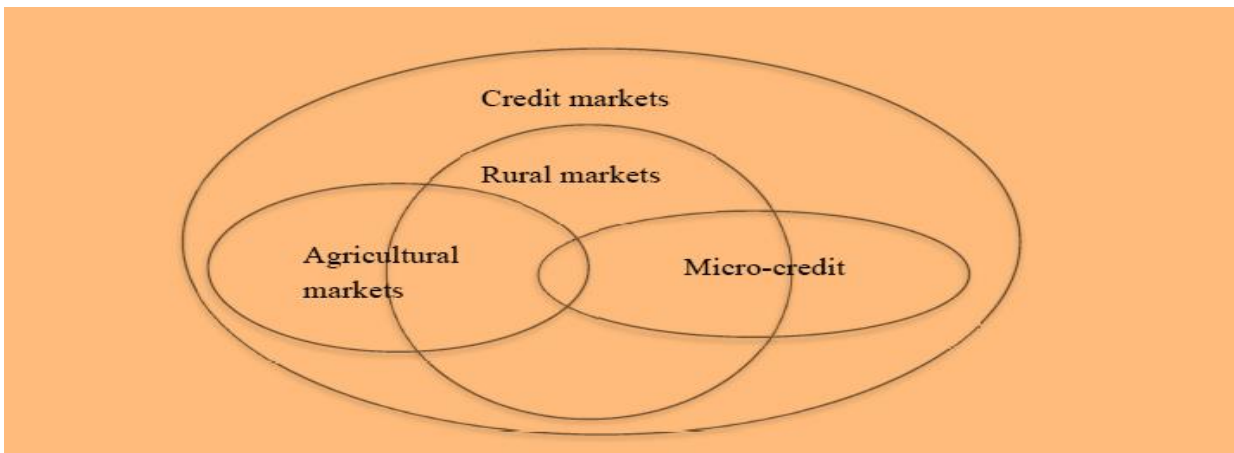
Urban agriculture can be defined as the growth of plants and the raising of animals inside and outside the city.

Microfinance is a financial service provided to the poor and low-income people, enabling them to obtain affordable funds to fund their activities to generate income, accumulate assets, stabilize consumption and manage risks. Financial services include credit products (microfinance), but also savings, remittances, and insurance.

Participation: the act of involvement in some activities.

Household: is defined in this research as people living under the same roof and eating food from the same pot. That is, a household member who did not live independently during the survey.

Rural: is any locality that exists primarily to serve agricultural hinterland.



Source: Ta Nhat L. et al 2019.

Figure 1 the relationship between credit markets

Credit is defined as the capacity or facility to gain goods and services in exchange for a promise to pay for them later (Beckman and Foster, 1969). Similarly, credit is the power or ability to obtain money, by the borrowing process, in return for the promises to repay the obligation in the future. Credit is necessary for a dynamic economy because of time elapsed between the production of goods and their ultimate sale and consumption. In the 1950s and 1970s, the World Bank (2004) highlighted the relevance of supplying credit to agriculture-based livelihoods. Up to today, there is a very strong belief that credit enables households to get involved in both the input and output markets, thereby improve their income, secure their expenditure, and obtain assets (Gonzalez-Vega, 2003).

Access to credit and credit limitation has been defined and measured by the two main methodologies. The meandering way refers to the reality of credit constraints that are based on abuse of the life-cycle/permanent income hypothesis, while the direct method employs the concept of demand and supply of credit, i.e., access to credit is calculated by the difference between the demand and the supply. However, much empirical evidence on the life-cycle/permanent income hypothesis has been unpersuasive.

It is the second strategy in defining and measuring credit access that is strictly related to figure out the determinants of credit access. In this method, the borrowers are honestly asked about their demand and their loan requests, as well as exposure to loan refusals. The socio-economic characteristics of the households are collect as determinants of credit access from the borrowers' view. Regarding credit supply, the lenders are probably to be constrained by factors on the amount of money that they can lend. That means that sources of credit are limited and the financial institutions have to choose their potential borrowers based on the possibility of failure to pay. Zeller also indicated that credit rationing is one of the measurements of access to credit. He also divided the factors that affect the demand for credit and the supply of credit. The process starts from whether households decide to take credit or not. If they choose to take, then loan rationing is the amount that they can get from the financial sectors or lenders. In that case, the lenders have the right to partially or fully reject or approve the requested loan (Zeller et al 2017).

Households' access to credit markets can be defined as forthcoming financial services to get credit. Most importantly, credit is defined that households have access to specific available credit sources. Consequently, access to credit is measured by the largest amount of money that households can borrow. Access to credit in some research papers was defined as “the difficulty of capital accessing by poor households”. The gap between the two thoughts of "access to formal credit" and "participation in formal credit programs" has been shown in some studies. In some studies, these two concepts are interchangeably used. Participation in credit programs is a matter that households can choose to participate in, while access to credit often implies barriers when entering the markets is the difference between the two concepts (Zeller et al 2017).

2.2 Theoretical Literature Review

2.2.1 History of Credit

Consumer credit may seem like a fairly new invention, but it's actually been around for more than 5,000 years. In fact, many millennia before the credit score became ubiquitous, there is historical evidence that cultures around the world were borrowing for various reasons. From the writings in Hammurabi's Code to the exchanges documented by the Ancient Romans, we know that credit was used for purposes such as getting enough silver to buy a property or for agricultural loans made to farmers and today, credit is everywhere (Jeff Desjardins, 2017).

The development of banking in Africa followed the demand of exchange networks from traditional indigenous economies to colonial exchange with the European world. The establishment of European banking institutions reflected the needs of the capitalist economy introduced by colonialism. The banking management of late nineteenth century and early twentieth century European banks adhered to the interests of shareholders. In Africa, after decolonization the political economy of African independence resulted in state capturing of financial institutions in most African countries (Grietjie Verhoef, 2017).

The South African banking system developed in close adherence to the British model. State-owned post-independence banks in Africa failed to deliver the development envisaged. Structural adjustment of African economies and new market-oriented policies allowed the development of locally owned private banking institutions. The high-cost structure of the formal banking system from the dominant South African banks incentivized the mobile money

innovation, an arena where African entrepreneurs lead global markets. Financial inclusion remains low in Africa (Grietjie Verhoef, 2017).

2.2.2 Brief History of Credit Access in Ethiopia

The history of the use of modern money in Ethiopia can be traced back more than 2,000 years (Pankhurst, cited in Gedey 1990). It flourished in what is called the Axumite era, from 1000BC to around AD 975. Leaving that long history aside, modern banking in Ethiopia began in 1905 with the establishment of Abyssinian Bank, based on a 50-year agreement with the Anglo-Egyptian National Bank. In 1908, a new development bank (called Socié'té Nationale d'Ethiophe pour le De'veloppement de l'Agriculture et du Commerce) and two other foreign banks (Banque de l'Indochine and the Compagnie de l'Afrique Orientale) were also established (Pankhurst 1968, cited in Degefe 1995). These banks were criticized for being wholly foreign-owned. In 1931, the Ethiopian government purchased the Abyssinian Bank, which was the dominant bank, and renamed it the Bank of Ethiopia – the first nationally-owned bank on the African continent (Gedey 1990: 83; Degefe 1995: 234).

Ethiopia is a multi-ethnic country with more than 83 languages. The main languages are Amharic (official government language), Tigrinya and Oromiffa. Christianity and Islam are the main religions.¹⁶ Ethiopia is rich in human and natural resources with a large amount of arable land, a huge livestock population, a diverse climate, a variety of crop species and in some regions abundant water and wildlife. Despite such an enormous potential, and compared to some other African countries, the economy has performed minimally. The country has immense problems of food security, unemployment, poverty and dependency on external economies (Martina Wiedmaier-Pfister et al. (2008)).

Most of the population is dependent on smallholder agriculture and subsistence farming. Agriculture employed over 80% of the population and contributed 42% of the Gross Domestic Product (GDP) in 2004/5. The sector suffers from frequent drought and poor cultivation practices. Coffee is critical to the Ethiopian economy with exports of \$350 million in 2006, 35.5% of total export earnings. Severe droughts, such as those in 2003/04 and at end 2005, are a recurrent reality for regions such as Affar, Gambela and Somali Land. Inadequate roads, water and pastureland, as well as shallow agricultural markets, means Ethiopia suffers from

chronic food shortages, and about five million people continue to depend on food aid even with favorable weather conditions. Nevertheless, agricultural was forecast to grow at an average of 7.4% in 2006 and 2007. The rural population, which accounts for about 85% of the population, is in areas where communication and transportation facilities are poorly developed. Ethiopia has one of the lowest road and telephone densities per inhabitant in sub-Saharan Africa. Rugged terrain further complicates accessibility and increases transaction costs in reaching the rural population (Martina Wiedmaier-Pfister et al. (2008)).

At present, the Ethiopian financial sector is dominated by the banking sector, which accounts for about 94% of total financial sector assets, with remaining assets accounted for by the insurance sector (3% in 2006) and MFIs (3%) (Martina Wiedmaier-Pfister et al. (2008)).

Financial services for the poor, or microfinance, can be a powerful tool to fight poverty. Access to a well-functioning financial system can empower individuals both economically and socially, allowing them to integrate more successfully into the economy of their countries, actively contribute to their development, and protect themselves against economic shocks. The financial sector is central to meeting the Ethiopian government's developmental goal of poverty alleviation and private sector growth. It is increasingly understood that adequate financial services such as loans, savings products, insurance and payment services for the broad population, including poor households, poor farmers and MSMEs, promote equality and productivity (Martina Wiedmaier-Pfister et al. (2008)).

The formal financial institutions of Ethiopia include the Commercial Bank of Ethiopia (CBE), Development Bank of Ethiopia (DBE), and National Bank of Ethiopia (NBE) and the recently proliferating private commercial banks like Dashen, Wogagen, Abysinia, Awash International, Nib-International, etc; and the non-banking financial institutions like the public and private insurance companies (Ethiopian Insurance Corporation (EIC), Abay, NYALA, Africa, Awash, etc.).

There are 21 micro-financial institutions formally recognized and accepted by the National Bank of Ethiopia (NBE, 2003). By the power vested in it, the NBE has licensed and has been regulating several financial institutions since the introduction of the market reform of 1994, Proclamation No. 83/1994 (Mekonen Kassahun Hagos, 2014).

The formal financial institutions currently found in Ethiopia can be categorized into three based on ownership, viz., public banks and insurance companies, private banks and insurance companies, and micro-finance institutions.

Microfinance Institutions (MFIs): These are credit and saving institutions established following Proclamation No. 40/1996. The central objective of these financial institutions is to provide credit and saving services to the poor. That is, the loan policy by which these institutions are governed enforces each financial institution to give preference to the applications of rural and urban communities engaged in microeconomic activities whose cash requirements are small. Therefore, the loan extended to any single borrower by a licensed institution should not at any time exceed five thousand Birr.

2.2.3. The Impact of Credit Access in Ethiopia

It is undeniable that access to credit has had a huge socio-economic impact on rural households, such as an increase in output/production, an increase in household income, and a poverty reduction. The agricultural productivity of credit-constrained households may be lower than that of unconstrained households (Alvaro Reyes, Robert Rensink, Ali Kuifenhofen, and Henk Moore, 2012). A positive correlation between institutional credit access and productivity growth among subsistence food crop farmers in Nigeria was found. Most subsistence farmers in Ethiopia cannot obtain credit to improve their production, income, and well-being. The increase in output and income will lead to the development of farmers' welfare, thereby reducing poverty in the rural economy. It is believed that credit helps to improve agricultural and non-agricultural income and family life in rural areas. It is believed that credit can help improve agricultural and non-agricultural income and family life in rural areas. On the other hand, non-agricultural activities are closely related to poverty reduction (Alvar R. et al 2012).

In the study of Das et al., formal access to credit has a positive effect on household income. Expand their livelihood activities and help them improve their living standards; increase their annual income and welfare conditions. Although many studies have found that rural credit has a direct and statistically significant impact on output and production, other studies believe that access to credit indirectly affects output and poverty. Credit only indirectly increases agricultural production through the purchase of various inputs. Different authors argue that the

indirect effects of credit access created by obtaining more efficient products and labor are more important than the direct effects. Poverty alleviation does not come from directly providing credit to the poor. Even, in reality, the poorest people may be excluded from formal lenders because they are at greater risk than other groups. Das et al. We have studied the impact of credit on poverty reduction from formal, semi-formal, and informal credit channels. Although there is a large amount of research supporting the important relationship between access to credit and output and poverty reduction, some researchers have published results that are contrary to this relationship (Alvar R. et al 2012).

2.2.4. Determinants of Credit Access

Credit sources in most countries/regions are generally divided into three categories: formal credit, semi-formal credit, and informal credit. The formal is the source of credit from commercial banks or the state. Informal credit comes from relatives, individual lenders, and associations. The semi-formal sector includes microfinance institutions or non-governmental organizations, government-supported loan programs for specific population groups, and other non-governmental projects. Informal people can form money lenders, informal credit associations, relatives, or friends.

In many studies, the factors that affect households' access to formal credit opportunities are considered to be the two main players in the framework of Figure 2: Borrowers represented separately by demand and supply factors in the previous section -Household/credit needs and lenders-credit providers. The demand factor may provide information about whether the household is constrained, while the supply factor represents the amount that the borrower can obtain from a given source of credit.

The determinants of credit acquisition can also be divided into observable factors and unobservable factors. The observable factors can be the socioeconomic characteristics of the family and the factors that affect the lender's decision-making, while the unobservable factors are the social capital/network interacting with the two participants in the framework. On the other hand, a semi-formal credit market dominated by NGOs, while government-supported credit programs usually target specific demographic/customer groups (especially low-income or poor people). Therefore, the loan processing and loan amount in the semi-formal market will

be very different from normal financial institutions. Semi-formal lenders' loan procedures are usually fixed standards. Therefore, research on semi-formal lenders' behavior is very difficult. There is very little literature on this point. This is why this article does not focus on the determinants of semi-formal lenders' behavior (Ta Nhat L. et al 2019).

The observable factors are socioeconomic characteristics, and family abilities have been determined in many studies in many developing countries (Ta Nhat L. et al 2019).

Age, number of family members, and income all affect access to credit. Household income, household size, bank distance, loan term, loan processing, interest rate, and loan size are the main factors affecting the accessibility of Philippine household credit. It can be found that the interest rate is an obvious positive factor. In many developing countries, education can be regarded as one of the most important determinants of access to credit. An educated householder means better knowledge, better skills, and credit market information (Temesgen Bocher, March 2017).

Another factor closely related to family size and family income is the dependency ratio. The more dependents in a family: the higher the possibility of poverty, or the fewer members with a fixed income, so the family may be subject to formal credit constraints. Group membership seems to increase the family's possibility of obtaining agricultural credit, especially in terms of access to microfinance programs. It has been explained that this factor is the guarantee of the family loan as a member of the association. Honohan, 2004 pointed out that the source of credit proved to be an important factor in obtaining credit, which is a surprising result. This means that compared with the formal market, households prefer to participate in the informal market. Even in the study of Boucher and Guirkingner, informal credit markets may be the first choice due to risk. However, in other studies, formal and informal credit accessibility has been implied as completely independent and unrelated. Kochar argues believes that the decision to borrow from households through formal financial sectors in rural India is influenced by the amount obtained in the informal credit market. Others pointed out the determinants of non-institutional credit contracts, in which interest and loan size are key factors.

2.2.5. Conceptual Framework of Access to Credit

The conceptual model for the study is to identifying and analyzing the impacts of households' socioeconomic characteristics on access to Credit and the significant role of access to credit on households' welfare improvement.

Financial services access has two dimensions: demand and supply (Stijin, 2005). The demand side examines the choice made by individuals concerning services provided by financial institutions, while the supply side relates to financial services provision or financial intermediation. Theories on access to financial services provide a general framework for the demand for financial services (demand dimension of access) and financial intermediation (supply dimension of access to financial services) or, at least, for understanding these concepts of access to financial services.

There is a well-established literature on access to financial services (Stijin, 2005) that covers or explains the determinants of credit constraint (Chen & Chivakul, 2008; Awunyo-Vitor & Al-Hassan, 2013), lenders' credit-rationing behavior (Stiglitz & Weiss, 1981; Awunyo-Vitor et al., 2013), and the effect of credit on farmers' productivity (Boucher & Guirkinge, 2007; Awunyo-Vitor & Al-Hassan, 2013). Availability of finance (either from savings or credit) and insurance provides greater incentive for households to project into technologies that improve productivity and incomes. Access to financial services has an effect on technology choices with a succeeding increase in production per yield.

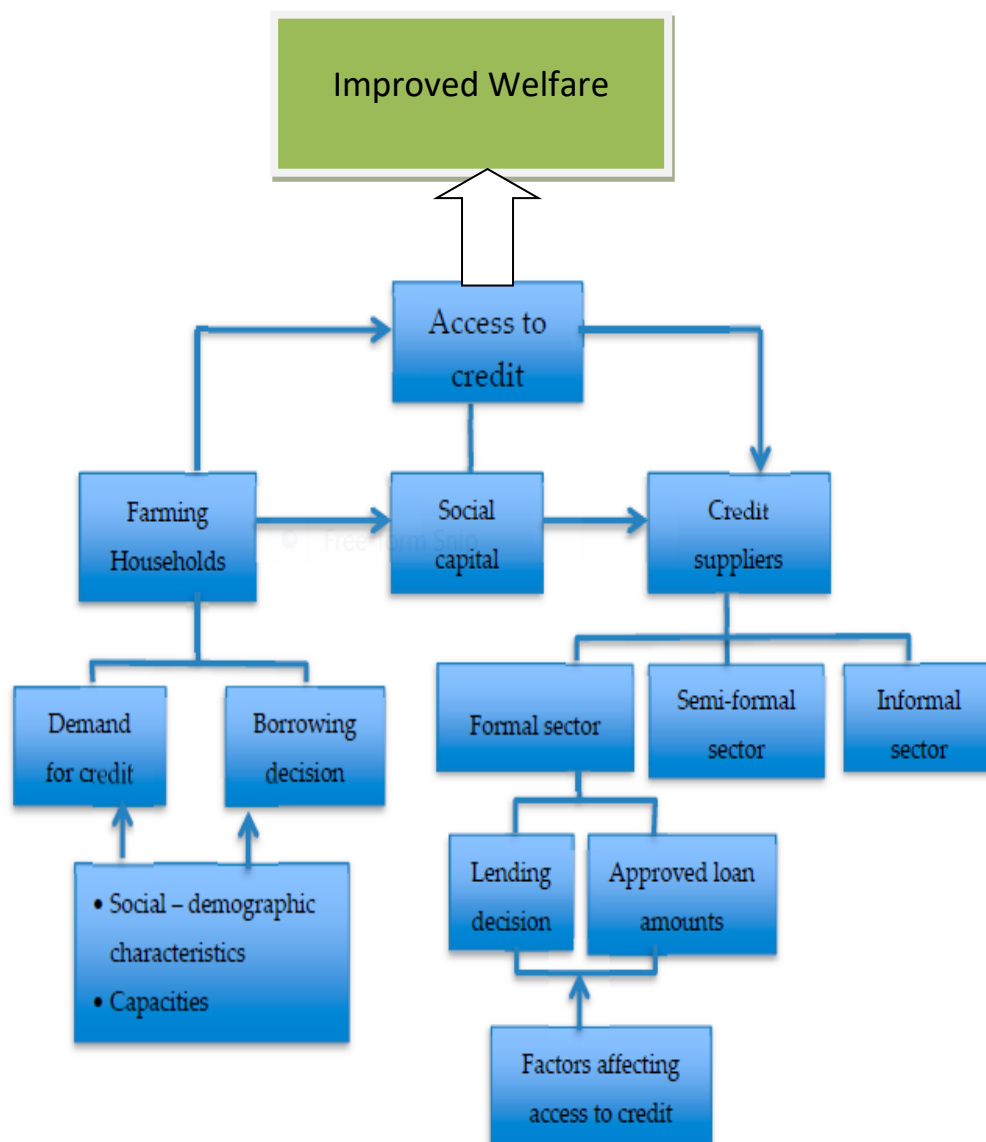


Figure 2: Conceptual Framework of Access to Credit and its impact on the welfare

2.3. Empirical Literature Review

Empirical evidence revealed that a surge in financial inclusion (FI) promotes inclusive growth perceived to be critical towards reducing poverty and income inequality (Park & Maercado, 2015), while others find that financial access is associated with lower rates of poverty and inequality, inferring that the use of financial services has a disproportionately positive impact on the poor (Beck, Demirgüç-Kunt and Levine 2007). There is also evidence that financial access is linked to improvements in the severity of poverty (Honohan 2004). Research

conducted in Pakistan and India reveals that the expansion of rural financial services is associated with improvements in household welfare (Khandker and Faruquee 2003) and that the development of bank branches increases non-agricultural economic output and reduces rural poverty. Microfinance has been hailed as a vital tool for the economic empowerment of poor households (Burgess and Pande 2005).

Research has shown that access to microfinance correlates with rising household income and consumption levels, less severe income inequality, and enhanced welfare. Studies have found a positive relationship between household characteristics, borrowing patterns, and expenditure levels (Mahjabeen 2008).

The International Literature on Credit Access relies on standard welfare indicators such as household consumption, expenditure, and income. Substantial research has focused on the issue of endogeneity in access to credit, and studies have shown that access to credit significantly influences economic incentives at the household level, improving consumption (Pitt and Khandker 1998) and altering positively consumption and investment decisions and impacting rates of wage growth and capital formation (Kaboski and Townsend 2012). However, not all studies have found a positive correlation between financial access and improved poverty indicators. Some analyses have failed to show a relationship between microfinance and household welfare, and find that access to credit has a limited impact on per capita incomes, food security, and the nutritional status of credit program beneficiaries (Diagne and Zeller 2001). Others have revealed a regressive distribution of benefits (Mosley and Hulme 1998). Moreover, methodological issues remain a serious concern. According to Jaikishan Desai and Tarozzi (2015), "Many proponents claim that microfinance has had enormously positive effects among borrowers.

However, the rigorous evaluation of such claims of success has been complicated by the endogeneity of program placement and client selection, both common obstacles in program evaluations. In this context, randomized control trials provide an ideal research design to evaluate the impact." To increase the analytical rigor of financial access studies, researchers have increasingly turned to randomized controlled trials. This methodology has been used to estimate the impact of access to microcredit by comparing outcomes among a random sample

of individual borrowers to those of non-borrowers with similar socioeconomic characteristics. Some of these studies have found that access to finance produced measurable benefits in the form of increased employment and food consumption (Dean Karlan and Jonathan Zinman 2010), other have displayed a significant impact on investment by small business, on profits by pre-existing businesses, as well on expenditure in durable goods, but not on consumption (Banerjee, Duflo, Glennerster and Kinnan 2015). Overall, these studies provide strong empirical evidence for a positive correlation between access to finance and household welfare.

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1 Research Design

The survey was designed to be implemented in two visits following the AgSS field schedule. For panel rural and small town households, the first visit took place between September and October 2015. In that visit, the post-planting agriculture and livestock questionnaires were administered. Crop cut was conducted between September to December 2015. The second visit took place between February and April 2016 when the household, community and post-harvest agriculture questionnaires were administered.

For the Urban households that are added during the second wave, all questionnaires were administered in one visit that took place between February and April 2016. The agriculture and livestock questionnaires were implemented differently in urban areas (small and medium/large towns) than in rural areas. For medium and large urban households, only the livestock questionnaire was administered. For small towns both agriculture questionnaires including post planting and post-harvest as well as the livestock questionnaire were administered. Agriculture interviews for small town areas didn't include crop-cut and land measurement by the enumerator and thus only include self-reported estimates.

Therefore, the research was designed to assess the impact of credit access on welfare outcomes improvements by using the secondary and socio economic survey data in Ethiopia.

3.2 Data Type, Source and Methods of Collection

The sample was a two-stage probability sample. The first stage of sampling entailed selecting primary sampling units, or CSA enumeration areas (EAs). A total of 433 EAs were selected based on probability proportional to size of the total EAs in each region. For the rural sample, 290 EAs were selected from the AgSS EAs. A total of 43 and 100 EAs were selected for small town and urban areas, respectively. In order to ensure sufficient sample size in the most populous regions (Amhara, Oromiya, SNNP, and Tigray) and Addis Ababa, quotas were set for the number of EAs in each region. The sample is not representative for each of the small

regions including Afar, Benshangul Gumuz, Dire Dawa, Gambella, Harari, and Somali regions. However, estimates can be produced for a combination of all smaller regions as one “other region” category.

Until recently, Ethiopia has experienced substantial gaps in generating adequate and timely data to support policymaking. The household survey on socioeconomic characteristics and credit access is taken from the third wave of the Ethiopian Socioeconomic Survey conducted in 2015/16 by CSA and World Bank. Ethiopian Socioeconomic Survey (ESS) is a nationally representative survey of over 5,000 households living in rural and urban areas and it is a panel survey. This study has used the third wave cross-sectional data from Ethiopia Socioeconomic Survey 2015/16.

The survey includes detailed information about household's demographic characteristics, education, health, and housing characteristics, household assets, agriculture, Non-Farm Enterprises (NFEs), other income, finance, consumption, expenditure, food security, and shocks. A total of 2,676 households were sampled for the study of this paper.

The participation decision on the credit facility is potentially endogenous to the outcome variable, food security. Investigating and assessing the relationship between poverty, access to credit and food security involves complex dealings in addition to selection bias. It is difficult to estimate the impact of credit on food security and expenditure accurately and reliably neither by Ordinary Least Square (OLS) estimation nor Two-Stage Least Square methods, making the inferences based on such results could be misleading (Dadson Awunyo-Vitor, Daniel Bruce and Al-Hassan, 2013). The decision whether to take credit or not depends on different characteristics of the households such as sex, age, education level, ownership of assets, and household size.

In this study, food security is measured by the average number of meals consumed by adults per day. Zizza et al. (2008), strongly suggests that the frequency of meals consumed per day is found to be one of the most important indicators of food security. Consumption frequency (meal consumed per day) is positively correlated with food security since food-secure households are found to consume more meals per day than food insecure households

According to (Zizza et al., 2008). Poverty is evaluated by the real consumption per capita per adult per month considering the poverty line set up in Ethiopia.

3.3 Method of Data Analysis

3.3.1 Descriptive Statistics

The secondary data were analyzed by descriptive statistics and Econometric analysis method. The descriptive statistics shows that the mean of independent variables with respect to dependent variable. Under this thesis the researcher have reviewed relationship between the dependent variable with independent variables and the correlation coefficient of the variable has been described the socio economic characteristics of the households and the institutional factors.

In this study, the researcher used descriptive statistics such as mean, median; percentages and frequency distribution were used in describing the socio-economic and demographic characteristics of the households.

In analyzing the determinants of change in the households' welfare across the waves, the study explores the relationship between household welfare and their endowment for constrained and unconstrained households using the socio economic data set collected in Ethiopia. Specifically, the study estimated a switching regression model using the semi-parametric technique introduced by Maddala (1986). This technique allows the control both for selection into the observed constraint regime and endogeneity of explanatory variables. Following the basic theory of impact evaluation in Khandker et al. (2009).

3.3.2 Econometric Model

Selection bias is a challenge in impact evaluation when non-experimental data were used for analysis. For our case households may have credit access due to observable and unobservable variables. Thus, evaluating the impact of credit access on household welfare without considering self-selection might suffer from potential endogeneity bias and thus the estimated results may over or under-estimate the actual impact.

Many kinds of literature use an endogenous switching regression model to avoid endogeneity

problem due to self-selection. To estimate the impact of credit on household welfare we applied an endogenous switching regression model with a two-stage procedure. In the first stage, a probit model was used as a selection equation, the dependent variable would be whether the household takes credit or not. In the second stage, linear regression models were used. The overall econometric modeling framework used for this study is described below.

A household (i) takes credit if the expected utility from taking credit(U_h) is higher than the expected utility from not taking credit(U_{nh}). Let A_i^* be the latent variable that captures the benefit from taking credit by the i^{th} household, and given as:

$$A_i^* = Z_i\alpha + \varepsilon_i \quad \text{where } A_i = \begin{cases} 1 & \text{if } Z_i\alpha + \varepsilon_i > 0 \\ 0 & \text{otherwise} \end{cases} \quad (1)$$

Where Z is a vector of household and village level variables that affect the decision to access credit and ε is an error term.

The outcome equations for both credit users and non-users corrected for endogeneity are given as:

$$\text{Regime 1: } Y_{1i} = X_{1i}\beta_1 + \sigma_{1t}\lambda_{1i} + \mu_{1i} \quad \text{if } A_i = 1 \quad (2a)$$

$$\text{Regime 2: } Y_{2i} = X_{2i}\beta_2 + \sigma_{2t}\lambda_{2i} + \mu_{2i} \quad \text{if } A_i = 0 \quad (2b)$$

Where Y_i is the outcome (per capita food expenditure or per capita total annual expenditure) variable in regimes 1 and 2, and X_i represents vector of household and village level characteristics that affects household welfare. $\lambda_{1i} = \frac{\phi Z_i \hat{\alpha}}{\theta Z_i \hat{\alpha}}$ and $\lambda_{2i} = \frac{\phi Z_i \hat{\alpha}}{1 - \theta Z_i \hat{\alpha}}$ are the Inverse Mill's Ratios(IMR) computed from the selection equation (Eq. 1) and are included in Eq. (2a) and (2b) to correct for selection bias in a two-step estimation procedure. β and σ are parameters to be estimated, and μ is an independently and identically distributed error term.

Explanatory variables used for both selection and outcome equation includes; dummy for sex of the household head in which heads are male, household head age, dummy for the educational level of the household head in which the heads are literate, household size, total

land holding, dummy for owning non-farm enterprise in which the household owns the non-farm enterprise, dummy for participated in agricultural extension program, and dummy for perceived drought in which the household affected by drought, livestock holding in Tropical Livestock Unit (TLU), number of ox owned, and dummy for fertilizer used. Using the same explanatory variables in estimating Regime 1 and 2 may not lead to a collinearity problem because of the non-linearity of Inverse Mill's Ratios (λ). If collinearity is an issue, the significance level of the variable of interests will not be affected due to the lack of exclusion restriction in Regime Equations 1 and 2. This is because we did use separate regression for credit users and non-users was estimated and then the predicted actual and counterfactual outcomes were compared to explore impacts of credit access.

The endogenous switching regression model can be used to compare the expected outcome variables (per capita food expenditure or per capita total annual expenditure) of the rural households that takes credit (Eq. 3a) concerning the rural households that did not take credit (Eq.3b), and to investigate the welfare of the expected household in the counterfactual hypothetical cases (Eq. 3c) that the households use credit did not use, and (Eq. 3d) that rural households do not use credit. The conditional expectations for household welfare indicators in the four cases are specified in table 2 and defined as follows:

$$E[Y_{1i}|X, A_i = 1] = X_{1i}\beta_1 + \sigma_{1t}\lambda_{1i} \quad (3a)$$

$$E[Y_{2i}|X, A_i = 0] = X_{2i}\beta_2 + \sigma_{2t}\lambda_{2i} \quad (3b)$$

$$E[Y_{2i}|X, A_i = 1] = X_{1i}\beta_2 + \sigma_{2t}\lambda_{1i} \quad (3c)$$

$$E[Y_{1i}|X, A_i = 0] = X_{2i}\beta_1 + \sigma_{1t}\lambda_{2i} \quad (3d)$$

Case (Eq. 3a) and (Eq. 3b) are observed from the data. However, (Eq. 3c) and (Eq. 3d) are the counterfactual outcome where the treated happened to be untreated, and the untreated happened to be treated. Then, we calculate the average impact of the treatment on the treated households (ATT) as the difference between (Eq. 3a) and (Eq. 3c) which represents the effect of credit on household welfare.

$$ATT = E[Y_{1i}|X, A_i = 1] - E[Y_{2i}|X, A_i = 1] \quad (4a)$$

$$= X_{1i}(\beta_1 - \beta_2) - \lambda_{1i}(\sigma_{1t} - \sigma_{2t}) \quad (4b)$$

In the same way, the average impact of the treatment on the untreated (ATU) for the households that actually did not own credit can be calculated as the difference between (Eq. 3d) and (Eq. 3b);

$$ATU = E[Y_{1i}|X, A_i = 0] - E[Y_{2i}|X, A_i = 0] \quad (4a)$$

$$= X_{2i}(\beta_1 - \beta_2) - \lambda_{2i}(\sigma_{1t} - \sigma_{2t}) \quad (4b)$$

Where Y_1 and Y_2 are food and nutrition security indicators (per capita calorie intake, per capita food expenditure, or per capita total expenditure), X_1 and X_2 are sets of explanatory variables affecting household welfare in regime 1 and 2, respectively. β_1 and β_2 are parameters to be estimated.

Table 1; Conditional expectation and treatment

Sub-samples households	Decision stage		Treatment effect
	Take credit	Not take credit	
Take credit	$E[Y_{1i} X, A_i = 1]$	$E[Y_{2i} X, A_i = 1]$	AAT
Not take credit	$E[Y_{1i} X, A_i = 0]$	$[Y_{2i} X, A_i = 0]$	AAU

3.4. Definitions of Variables, Measurements and Hypothesis

Table 2; For the probit model used the following variables were described and measured.

VARIABLE	SYMBOL	TYPE	A PRIOR EXPECTATION
Dependent Variable			
Credit Status: 1= Access to credit, 0= otherwise		Binary	-
Independent Variables			
Age (Age of household head in	AGE	Continuous	Age is hypothesised to negatively affect the probability of having access to credit, in so

years)			far that older clients may not be as active as younger ones in their enterprises.
Gender (Male=1,0 otherwise)	GENDE R	Binary	Male are expected to have greater access to credit than female, hence its expected sign is Positive.
Education (No of years spent in school)	SCHAT TEN	Continu ous	The coefficient is expected to be positive. Higher levels of education imply better technical knowledge and skills, more information on markets and facilities provided by financial institutions.
Monthly income (in Birr)	MINCO M	Continu ous	Monthly income is posited to affect negatively access to credit. Its sign is Expected to be negative.
Land ownership	LANDO WN	Binary	Land ownership, as opposed to rental and other form of access to land is expected to increase the long run investment incentives and the collateral value of the land to lenders. Its expected sign is positive.
Assets (Estimated value in Birr)	ASSET	Continu ous	The coefficient is expected to be positive, especially if the value is high, it could serve as collateral for credit obtained.
Savings (in Birr)	SAVING	Continu ous	The sign is indeterminate. It may influence the lender to grant credit or may inhibit access.
Dependency ratio	DEPRA TIO	Continu ous	High dependency ratio is posited to affect negatively the probability of access to credit. Its coefficient is expected to be negative.

Repayment record (Good repayment record = 1, 0 otherwise)	REPYT RCD	Binary	It is posited that clients who repaid their previous loans are perceived as creditworthy and are provided with more in the subsequent season or year.
Awareness (Aware of a credit source = 1, 0 otherwise)	AWARE N	Binary	Awareness may have a strong bearing on accessibility of credit hence its sign is expected to be positive.

Selection of explanatory variables

The set of independent variables that are hypothesized to determine consumption includes demographic and household level characteristics.

Table 3: Selection of explanatory variables

Variable	Measurement	A prior Expectation
Age	Completed years	Indeterminate
Gender	1 if male; 0 otherwise	Male-headed households are expected to generate better welfare outcomes than female.
Education	Number of years of schooling	Education is expected to lead to increase earning potential and consequently increase welfare
Dependency ratio	This is measured as the number of dependants (aged 0-14 and over the age of 65) to the total household size, Expressed as a percentage.	Dependency ratio is positively Related to welfare. High dependency ratio exerts consumption stress on the Households.
Primary occupation	1 if farming; 0 otherwise	Indeterminate
Land ownership	1 if yes; 0 otherwise	Land ownership is expected to increase household welfare
Credit availability	1 if yes; 0 otherwise	Credit availability is expected to increase household welfare
Per Capita Income (PCI)	Amount in Birr.	This is expected to negatively influence poverty

CHAPTER FOUR

4. RESULT AND DISCUSSIONS

This chapter presents and discusses the findings of the study based on descriptive statistics and econometric analysis.

4.1. Descriptive Results

From the total sample, 77% were male headed households and 23% were female headed households (Table 3). Out of the total sample households taken 75% and 25% were without credit and with credit, respectively. Out of without credit households, 75 % and 25% were male headed and female headed households. On the other hand, female headed and male headed households were 17% and 83%, respectively for credit user households. As presented in Table 3, the chi-square value showed that there was a statistically significant difference between male-headed and female-headed households with regards to take credit or not.

Table 4: Sex composition of the sample household heads

Variable	Without credit		With credit		χ^2
	N	percentage	N	percentage	
Sex of the household head					
Male	1,511	75.44	558	82.91	16.05***
Female	492	24.56	115	17.09	

The chi-square value showed that there was a statistically significant difference between male-headed and female-headed households with regards to their credit utilization.

Table 5 Composition of Perceived drought

Variable	Without credit		With credit		χ^2
	N	percentage	N	percentage	
Perceived drought					
Affected	629	31.40	232	34.47	2.17
Unaffected	1,374	68.60	441	65.53	

The chi-square value showed that there was no statistically significant difference between perceived drought affected and unaffected households with regards to their credit utilization.

Table 1: Composition of Fertilizer use

Variable	Without credit		With credit		χ^2
	N	percentage	N	percentage	
Fertilizer use					
User	976	48.73	364	54.09	5.79**
Non-user	1,027	51.27	309	45.91	

The chi-square value showed that there was statistically significant difference between fertilizer user and non-user households with regards to their credit utilization.

Table 2: Composition of Non-farm enterprises ownership

Variable	Without credit		With credit		χ^2
	N	percentage	N	percentage	
Non-farm enterprise ownership					
Owned	585	29.21	259	38.48	20.08***
Not owned	1,418	70.79	414	61.52	

The chi-square value showed that there was statistically significant difference between non-farm enterprise owned and not-owned households with regards to their credit utilization.

Table 3: Composition of Agricultural extension participation

Variable	Without credit		With credit		χ^2
	N	percentage	N	percentage	
Agricultural extension participation					
Participant	810	40.44	353	52.45	10.43***
Non-participant	1,193	59.56	320	47.55	

The chi-square value showed that there was statistically significant difference between participant and non-participant households on agricultural extension with regards to their credit utilization.

Table 4: Family sizes, educational level and mean difference

	(1)		(2)		(3)		(4)
	Total sample		With credit		Without credit		Mean difference
	Mean	SD	Mean	SD	Mean	SD	
Food expenditure	17713	14925	171256	14254	19463	16652	2338***
Total consumption	21905	16757	21167	16186	24102	18186	2935***
Per capita consumption	4394	3029	4362	3067	4491	2914	128.66
Per capita food exp.	3566	2710	3547	2723	3622	2671	74.35
Educational level	0.32	0.47	0.32	0.47	0.34	0.48	0.03
Land holding	1.34	1.96	1.31	1.94	1.44	2.00	0.13
Household size	5.33	2.30	5.23	2.33	5.61	2.19	0.38***

The above mean difference showed that there was statistically significant mean difference on food expenditure and per capita consumption between credit user and non-user households.

4.2 Econometric Result

Table 9 presents results impact of credit on households' welfare outcomes from endogenous switching regression model. The outcome variable is per capita annual food expenditure. Estimated results describes that households who actually take credit would have about 166 Birr less annual per capita food expenditure if they did not take credit. In the counterfactual case if those households that did not take credit took credit, their per capita annual food expenditure would be increased by about 112 Birr if they take credit.

Table 5: Impact of credit on per capita food consumption

Type of households	Per capita annual food consumption		
	With credit	Without credit	Treatment effect
Households with credit (N=673)	3621.689 (46.386)	3455.688 (40.693)	ATT 166.001*** (61.706)
Households without credit (N=2003)	3659.752 (29.428)	3547.339 (25.556)	ATU 112.41*** (38.976)

*** p<0.01, ** p<0.05, * p<0.1

Similarly, Table 10 presents estimates of impact of credit on farm household's welfare outcomes using endogenous switching regression model and alternative welfare indicator which is per capita total annual expenditure. Estimated results shows that households who actually take credit would have consume less total per capita expenditure which is less than by about 206 Birr if they did not take credit. On the other hand, if households that did not take credit took credit, their total per capita expenditure would be higher than by about 155 Birr if they took credit.

Table 6: Impact of credit on per capita total annual consumption

Type of households	Per capita annual total expenditure		
	With credit	Without credit	Treatment effect
Households with credit (N=673)	4490.613 (53.622)	4284.569 (49.624)	ATT 206.044*** (73.060)
Households without credit (N=2003)	4517.4 (33.819)	4361.952 (30.660)	ATU 155.45*** (45.648)

*** p<0.01, ** p<0.05, * p<0.1

Table 7: Marginal effects of explanatory variables

Variables	Per capita food expenditure			Per capita annual consumption	
	Marginal effect	With credit	Without credit	With credit	Without credit
Household head gender	-0.056**	-498.3	266.4	157.6	252.4
Household head age	-0.001**	13.02	5.513	26.02	6.453
Educational level	0.01	79.1	472.9**	188.6	712.6***
Land holding	0.008	38.27	95.25*	-39.76	129.6**
Household Size	0.013***	-259.8	-395.9***	-495	-469.2***
Perceived drought	0.022	269.9	51.55	-153.2	60.67
Livestock holding (TLU)	-0.005	94.28	101.3***	166.4	110.1***
Non-farm enterprise	0.070**	792.5	11.04	178.4	158
Ox	0.020*	-47.5	139.5	268.2	173.8
Agri. extension partic.	0.043	581	163.3	139	258.6
Fertilizer use	0.04	228.6	223.9	-80.31	319.9

***, ** significant at 1% and 5%, level respectively

Source: Own computation,

Family Size: This variable was significant at 1% probability level and positively related with credit use. The marginal effect of the variable indicates that keeping others constant, a unit increase in household member increases the probability of welfare outcome improvement by 1.3%.

This can be justified by the fact that an increase in family size the opportunity of increasing the per capita income of the member by engaging in different farming and non-farming activities.

Household head Gender: This variable was significant at 5% probability level and negatively related with credit use. The marginal effect of the variable indicates that being male headed households declines the probability of getting credit by 5.6%.

Household head Age: This variable was significant at 5% probability level and negatively related with credit use. The marginal effect of the variable indicates that if the age of households greater than 45 and less than 15 declines the probability of getting credit by 0.1%.

Non-farm Enterprises: This variable was significant at 5% probability level and positively related with credit use. The marginal effect of the variable indicates that if the households engaged in non-farm enterprises the probability of getting credit increases by 7%.

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Understanding the factors (both socioeconomic and institutional) influencing the impact of credit use on households' welfare outcomes is useful for future policy designs. This study attempts to identify and analyze the determinants of credit access in Ethiopia and its impact on households' welfare outcomes. On the basis of the secondary information collected from 2676 households and taking into account all the methodological pitfalls of studying the impact of credit access on households' welfare outcomes, descriptive statistical analysis was carried out and compared the mean of the two groups (credit users and credit non-users) with respect to important demographic, socioeconomic and institutional variables.

The result shows that access to credit increases the opportunity for livelihood diversification, which increases agricultural production and income. Credit user households have significantly larger mean annual food consumption and total per capita annual consumption as compared to credit non-user households. Having access to credit had significantly improved the welfare outcomes of households. In addition to their normal agricultural practices, credit user households participated in Non-farm Enterprises.

Based on the findings from the study, it can be concluded that the rural households are willing to use credit in order to improve their welfare outcomes. Thus, the participation of the community should be ensured in every decision making and formulation of policies and strategies which are related to credit use. This encourages the poor households to use any source of credit and microfinance and helps them to improve their welfare.

5.2 Recommendations

Based on the findings what we have got in the analysis part, in both descriptive and econometric analysis, the following policy recommendation remarks can be drawn for further consideration and improvement of credit access and welfare outcomes of households in Ethiopia.

Though the study revealed that getting credit improves households' welfare outcomes, there are no sufficient credit access even for those who have demand for credit. Therefore, the government has to incentivize Micro finances and other informal sources of credit to satisfy the demand of credit.

Extension service is a corner stone of agricultural practices. Access to extension services was positively and significantly related to households' welfare outcomes improvement. We recommend Ethiopian Universities and colleges to train quality experts in adequate number to the rural areas would increase the contact and flow of information between the concerned governmental and non-governmental bodies and rural households to improve their welfare thereby enhance the production and productivity of the rural sectors.

The study revealed that the number of livestock holding in terms of TLU influence participation decision of use of credit significantly and positively. Therefore, it should be given due attention to develop the livestock sector at least in feed resource improvement and protection and/or prevention of animal diseases.

The empirical results of this study showed that size of cultivated land is positively associated with households' welfare outcomes and it was one of the most constraining factors. The possibility of its expansion seems unwelcoming. Thus, to mitigate the problem of cultivated land scarcity, the existing land must be intensively used. Therefore, we recommend rural households should rather be encouraged to use intensive agricultural production methods.

The gender difference of household heads in probability of getting credit indicated female-headed households are more likely to get credit than the male headed household heads. Therefore, the government has to find out ways to increase their probability of getting credit and improve their welfare.

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	(1)		(2)		(3)		(4)
	Total sample		With credit		Without credit		Mean difference
	Mean	SD	Mean	SD	Mean	SD	
Food expenditure	17713	14925	171256	14254	19463	16652	2338***
Total consumption	21905	16757	21167	16186	24102	18186	2935***
Per capita consumption	4394	3029	4362	3067	4491	2914	128.66
Per capita food exp.	3566	2710	3547	2723	3622	2671	74.35
Educational level	0.32	0.47	0.32	0.47	0.34	0.48	0.03
Land holding	1.34	1.96	1.31	1.94	1.44	2.00	0.13
Household size	5.33	2.30	5.23	2.33	5.61	2.19	0.38***
<i>N</i>	2676		673		2003		

7. ANNEXES

Descriptive statistics with mean difference

Annex-1

Impact of credit on per capita food consumption

Annex -2

Type of households	Per capita annual food consumption		
	With credit	Without credit	Treatment effect
Households with credit (N=673)	3621.689 (46.386)	3455.688 (40.693)	ATT 166.001*** (61.706)
Households without credit (N=2003)	3659.752 (29.428)	3547.339 (25.556)	ATU 112.41*** (38.976)

*** p<0.01, ** p<0.05, * p<0.1

Impact of credit on per capita total annual consumption

Annex-3

Type of households	Per capita annual total expenditure		
	With credit	Without credit	Treatment effect
Households with credit (N=673)	4490.613 (53.622)	4284.569 (49.624)	ATT 206.044*** (73.060)
Households without credit (N=2003)	4517.4 (33.819)	4361.952 (30.660)	ATU 155.45*** (45.648)

*** p<0.01, ** p<0.05, * p<0.1

Determinants of decision level to take credit									Annex-4
Variables	Selection model		Per capita food expenditure			Per capita total expenditure			
	Coeff.	Marginal effect	With credit	Without credit	Total sample	With credit	Without credit	Total sample	
Household head gender	-0.180** (0.0856)	-0.056** (0.027)	-498.3 (1,297)	266.4 (285.3)	159.8 (147.4)	157.6 (1,455)	252.4 (340.8)	159.3 (162.0)	
Household head age	-0.00375* (0.00191)	-0.001** (0.001)	13.02 (25.86)	5.513 (7.211)	8.105** (3.965)	26.02 (30.52)	6.453 (8.298)	8.952** (4.187)	
Educational level	0.0331 (0.0673)	0.010 (0.021)	79.10 (330.9)	472.9** (209.4)	342.1** (165.7)	188.6 (368.8)	712.6*** (218.1)	579.6*** (174.3)	
Land holding	0.0268 (0.0175)	0.008 (0.006)	38.27 (176.2)	95.25* (50.77)	74.19** (33.21)	-39.76 (207.2)	129.6** (57.81)	103.9** (41.88)	
Household size	0.0404*** (0.0138)	0.013*** (0.004)	-259.8 (279.1)	-395.9*** (65.75)	-365.2*** (24.85)	-495.0 (317.3)	-469.2*** (76.49)	-445.0*** (28.55)	
Perceived drought	0.0684 (0.0882)	0.022 (0.028)	269.9 (571.5)	51.55 (186.1)	96.68 (168.7)	-153.2 (626.9)	60.67 (214.4)	57.36 (184.5)	
Livestock holding (TLU)	-0.0164 (0.0165)	-0.005 (0.005)	94.28 (125.8)	101.3*** (33.25)	100.2*** (27.69)	166.4 (142.2)	110.1*** (39.41)	110.8*** (32.74)	
Non-farm enterprise	0.219** (0.0865)	0.070** (0.028)	792.5 (1,571)	11.04 (451.1)	155.4 (148.3)	178.4 (1,778)	158.0 (511.4)	289.3* (162.0)	
Ox	-0.0633* (0.0349)	0.020* (0.011)	-47.50 (460.2)	139.5 (111.1)	115.3* (59.47)	268.2 (530.1)	173.8 (130.2)	163.0** (68.48)	
Agri. extension partic.	0.138 (0.100)	0.043 (0.032)	581.0 (935.2)	163.3 (282.5)	219.8 (152.4)	139.0 (1,061)	258.6 (314.7)	298.8* (174.5)	
Fertilizer use	0.129 (0.0950)	0.040 (0.030)	228.6 (910.2)	223.9 (272.5)	193.6 (160.9)	-80.31 (1,040)	319.9 (326.5)	298.3 (187.7)	
Afar	0.269** (0.134)	0.091** (0.048)	1,004 (1,979)	583.2 (913.6)	712.5 (856.6)	145.6 (2,278)	805.6 (1,120)	912.5 (1,065)	
Amhara	0.329* (0.169)	0.109* (0.059)	-571.3 (2,206)	-838.1 (626.0)	-832.2** (326.1)	-2,013 (2,474)	-855.6 (739.7)	-917.1** (410.5)	
Oromia	0.157 (0.138)	0.050 (0.046)	357.2 (1,138)	212.0 (443.8)	241.6 (381.8)	-422.2 (1,250)	349.7 (555.0)	294.0 (477.9)	

Somalie	0.400 (0.436)	0.139 (0.165)	840.7 (2,580)	812.0 (805.8)	782.1 (479.5)	-150.1 (2,849)	1,462 (1,000)	1,365* (693.4)
Benshagul	-0.284 (0.326)	-0.080 (0.081)	-1,986 (2,589)	-921.0 (605.8)	-1,053** (404.9)	-1,275 (2,918)	-961.4 (728.2)	-1,125** (496.6)
SNNP	-0.0878 (0.137)	-0.027 (0.041)	-1,257 (1,161)	-429.1 (344.6)	-549.6 (338.3)	-1,129 (1,279)	-507.2 (445.5)	-644.8 (427.7)
Gambelia	0.223 (0.279)	0.074 (0.099)	12.61 (1,579)	-6.047 (515.8)	-10.30 (370.2)	-341.5 (1,731)	258.1 (568.5)	306.0 (446.8)
Harari	-0.319*** (0.115)	-0.089*** (0.029)	2,387 (2,642)	2,476*** (521.7)	2,519*** (301.9)	3,881 (2,979)	2,829*** (630.8)	2,895*** (375.0)
Diredwa	0.655*** (0.132)	0.238*** (0.052)	2,671 (4,212)	981.1 (1,201)	1,541*** (347.5)	541.1 (4,772)	1,272 (1,410)	1,746*** (425.6)
mills1			2,484 (9,582)			-2,335 (10,868)		
mills2				-402.5 (3,578)			-181.6 (4,139)	
Constant	-0.782*** (0.262)		1,008 (12,757)	4,075*** (1,377)	4,164*** (404.9)	8,688 (14,418)	4,960*** (1,645)	5,041*** (467.4)
Observations	2,676		673	2,003	2,676	673	2,003	2,676
R-squared			0.203	0.176	0.174	0.228	0.200	0.199

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1