FACTORS AFFECTING LOAN REPAYMENT PERFORMANCE OF SMALLHOLDER FARMERS IN EASTERN HARARGHE, ETHIOPIA

BY

Million Sileshi Haile

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DECLARATION

This M.Sc. thesis is my original work and has not been presented for a degree in any other university.

Million Sileshi Haile..... Date .....18/01/12.....

This M.Sc. thesis has been submitted to the Board of Postgraduate Studies, University of Nairobi with our approval as university supervisors:

Dr. Rose Nyikal .....Date.....18 Jan 2012.....

Dr. Sabina Wangia .....Date.....18 Jan. 2012

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ABBREVIATIONS AND ACRONYMS

ACORD	Agency for Co-operation in Research and Development
ARDO	Agricultural and Rural Development Office
AIDB	Agricultural and Industrial Development Bank
CBB	Construction and Business Bank
CBE	Commercial Bank of Ethiopia
CSA	Central Statistics Authority
DBE	Development Bank of Ethiopia
EIC	Ethiopia Insurance Corporation
GDP	Gross Domestic Product
IFAD	International Fund for Agricultural Development
LDCs	Less Developed Countries
LPM	Linear Probability Model
MFI	Micro Finance Institution
NBE	National Bank of Ethiopia
OBPED	Oromiya Bureau of Planning and Economic Development
OLS	Ordinary Least Squares
OSCSC	Oromiya Saving and Credit Share Company
TLU	Tropical Livestock Unit

ABSTRACT

The use of credit has been envisaged as one way of promoting technology transfer, while the use of recommended farm inputs is regarded as key to agricultural development. Credit repayment is also of paramount importance to have viable financial institutions. In Eastern Hararghe, Oromiya Zone, the Regional Government and Non-Governmental organizations are extending credit facilities to farming households in order to narrow the gap between the capital required and the capital that the households possess, for the improvement of agricultural technologies that would increase production and productivity. However, there is a serious loan repayment problem in the area, which discourages rural finance organizations from promoting and extending credit. Loan defaults are estimated at 23.85 percent OSCSC (2009). Therefore, the objective of this study was to identify the factors affecting the loan repayment performance of farmers in Eastern Hararghe zone.

Primary data was collected through structured questionnaires, from 140 randomly selected farm household users of credit in two agro ecological zones of Eastern Hararghe . Secondary data was obtained from publications, seasonal and annual reports of the district, zonal and regional offices of the Ministry of Agriculture and Rural Development, Development Bank of Ethiopia, Micro Finance Office and other related organizations. Descriptive statistics were used to describe the socio-economic characteristics of the respondents, and the two-limit Tobit model was used to analyze the factors influencing loan repayment of smallholder farmers in the study area.

The results of the descriptive analysis revealed a significant mean difference between the defaulter and non-defaulter households in terms of education, experience of credit use, distance from credit source, technical assistance, livestock units, total annual income and total land. Moreover, off farm income, crop and livestock disease, social ceremonies and education level were systematically associated with loan repayment. However, other variable such as age, family size, amount of loan, were not significantly different between the defaulters and the non-defaulters.

The two limit Tobit model results indicated that seven out of the 16 explanatory variables considered influenced loan repayment performance in the area. Agro ecological zone, off-farm activity, and frequency of contact with extension agents positively and significantly influenced

loan repayment while, production loss, informal credit, social ceremonies, and loan-income ratio negatively influenced the loan repayment performance of small holder farmers in the study area.

The study recommends increasing the number of development agents to change the farmers' attitude toward agricultural transformation and timely settlement of debt. Rural development strategies should not only emphasize on increasing agricultural production but simultaneous attention should be paid to promoting off-farm activities in the rural areas. The social ceremonies which are commonly celebrated, require a great deal of investment ,beyond what the farmers can afford, and were found to be one of the major causes of delinquency in the payment of formal loans. Thus, there should be some sensitization for the elders, community leaders, local associations and religious organizations to realize the need to minimize these traditional ceremonies and mitigate the associated expenditure through time. The agro-ecology zone is one of the factors that affect the type and range of crops to be grown and animals to be kept. Therefore, policies and strategies geared towards the development and promotion of new technologies, suitable to moisture deficit areas, should be given adequate emphasis in order to improve the loan repayment capacity of smallholder farmers living in such drier areas of the zone. In addition membership of specific groups should be optional, to allow individual members to screen each other effectively, a phenomenon of group advantage for information symmetry that is not available in the emerging microfinance set ups which fix members to groups.

CHAPTER ONE: INTRODUCTION

1.1. Background

The economic growth of developing countries depends to a great extent on the growth of the agricultural sector. Ethiopia is one example of a developing country, characterized by a predominantly subsistence agrarian economy. The nature of farming in Ethiopia is dominated by traditional micro holdings of the subsistence type, with less than two hectares of land being the average holding (CSA, 2007). The principal components of the output of the sector are food crops, livestock and livestock products. Small farmers work on 96.3 percent of the total cultivated area and produce over 95 per cent of the national crop production, whereas private investors and state farms work on the rest (CSA, 2007).

Out of the total population, 83.8 percent live in rural areas and agriculture provides employment for not less than 80 percent of the total population (CSA, 2007). In 2008/09, this sector generated about 42.6 percent of the Gross Domestic Product (GDP) (NBE, 2009). Agriculture is also the life line of the export earning sector of the country, covering about 90 percent of all exports. The four major agricultural commodities: coffee, oilseeds, hides and skins, and pulses, accounted for 65 percent of the total export earning of the country between 2006 and 2009.

The Agricultural sector, however, is under performing, and several factors have been identified as being responsible for the situation. The factors include: use of traditional agricultural practices and implements; low inputs and lack of effective extension services; over grazing; serious erosion and depletion of soil fertility; lack of adaptive research; and the inadequacy of agricultural credit. Other factors include: deficient communication infrastructure; ecological

imbalance; inappropriate agricultural policies; poor market integration and political instability (Belay, 2002).

These factors condemn Ethiopia's agricultural sector to produce at subsistence level with incomes not adequate to cover the farmers' consumption and expenditures and allow them to invest back in to their farms. The low disposable incomes available at household levels have exacerbated the inability of smallholder farmers to improve agricultural production through acquisition and use of modern technologies.

In countries like Ethiopia where subsistence agriculture prevails and where small-holder farming dominates the overall national economy, farmers often face a scarcity of capital (saving) to adopt new agricultural technologies. Hence, short-term credits with favorable terms for seasonal inputs like fertilizer, improved seeds, pesticide and herbicides would generally be favored because better return would be achieved quickly within the crop season.

The use of credit has been envisaged as one way of promoting technology transfer, while the use of recommended farm inputs is regarded as key to agricultural development (Tomoya and Takashi, 2010). Therefore, the provision of sustainable credit for agricultural inputs is one of the most effective strategies for improving productivity among the resource poor farmers.

Delivering productive credit to the rural poor has been a hotly pursued but problem-plagued undertaking. Providing low-cost, efficient credit services and recovering a high percentage of the loans granted, is the basis for rural finance (Wenner, 1995), yet the combination has often been an illusion.

1.2. Statement of the Problem

In the subsistence agriculture sector, in low income countries such as Ethiopia, where smallholder farming dominates the overall national economy, smallholder farmers face a severe shortage of financial resources to purchase productive agricultural inputs. The prices of inputs rise very rapidly every year and consequently, the hope of the subsistence farmers on financial institutions for credit has become substantially higher in the recent times.

In Ethiopia, the importance of agricultural credit in the development of the sector has been emphasized strongly by various authors (Sonja and Nick, 2002; Anbes, 2007; Lenis etal., 2009; Tomoya and Takashi, 2010). All these authors had concluded that credit helps to bring about the required productivity and food self sufficiency through the adoption of new and improved technologies.

It is important that borrowed funds be invested for productive purposes, and the additional incomes generated, be used to repay loans in order to sustain and make the production process and credit institutions viable. But failure by farmers to repay their loans on time, or to repay them at all, has been a serious problem facing both agricultural credit institutions and smallholder farmers. Poor loan repayment in developing countries has become a major problem in agricultural credit administration, especially by smallholders who have limited collateral capabilities (Aja Okorie, 2004).

The loan default problem has had tragic effects leading to systems failure in the implementation of appropriate lending strategies and credible credit policies. In addition, it discourages the financial institutions from refinancing the defaulting members, which pits the defaulters in a vicious cycle of low productivity. Therefore, a thorough investigation of various aspects of loan defaulting is important for both the policy makers and the lending institutions.

Eastern Hararghe is part of the autonomous zone of the Oromiya Regional State. In this zone, widespread poverty and food insecurity are prevalent. It has been assumed that the lack of well-established and sustainable financial institutions is one of the root causes of the perennial poverty in the rural areas of the zone. Indeed, lack of access to financial services, reduces the availability of new technologies to rural households, leading to low agriculture productivity and food insecurity.

In Eastern Hararghe, Oromiya Zone, the Regional Government and Non-Governmental organizations are extending credit facilities to farming households in order to narrow the gap between the capital required and the capital that the households possess, for the improvement of agricultural technologies that would increase production and productivity. However, there is a serious loan repayment problem in the area. For instance, according to the East Hararghe Saving and Credit Share Company, in 2008/2009 and 2009/2010 up to the third quarter report, about 2,389,847.58 and 1,490,278.88 Birr (Ethiopian currencies, one Birr = 16.85 USD) in loans respectively, has not been repaid. This means that the recovery rate of credit for the year 2008/2009 of the Oromiya Saving and Credit Share Company (OSCSC) was 73.6 percent. As compared to other micro finances this loan recovery rate is very low during the study period. Although there are such severe problems, the factors that contribute to this situation are not known and have not been studied in the different agro ecological zones.

1.3. The Purpose and Specific Objectives

The purpose of this study was to examine the factors affecting the loan repayment performance of smallholder farmers in Eastern Hararghe, Ethiopia.

The specific objectives of the study were to:

1. Characterize the loan repayment performance across different prevailing institutional and socio-economic platforms; and
2. Analyze the factors that are likely to affect the loan repayment performance among smallholder farmers in Eastern Hararghe zone.

1.4. Hypotheses of the Study

The study delineated the following hypotheses:

1. The socio-economic and institutional factors are similar among defaulter and non defaulter of small holder farmers.
2. The environmental, socio-economic and institutional factors have no effect on loan repayment in Eastern Hararghe zone.

1.5. Significance of the Study

It was envisaged that the study would provide information that will enable effective measures to be undertaken to improve the loan repayment performance and the success of rural credit programs. It would also enable lenders, such as non-governmental organizations, and policy makers, to appreciate and understand where and how to channel efforts to minimize loan defaulting. The study was also expected to contribute towards better credit administration with a possible pay-off in improved loan repayment.

1.6. Scope and Limitations of the Study

The study was conducted in Eastern Hararghe Zone, of the Oromiya Regional State, in Ethiopia. As stated in the objectives, the main aim of the study was to identify important demographic, socio-economic and institutional factors that affect loan repayment performance of smallholder farmers who borrow from formal credit sources. Accordingly, the study was conducted in two

districts of the Eastern Hararghe Administrative Zone, Combolcha and Babile districts, which represent the highlands and lowlands respectively. The study randomly selected 70 households for each region; these were the users of credit from formal sources during the 2008/2009 agricultural production year.

The study was concerned with the analysis of the main determinants of formal loan repayment performance of Eastern Hararghe Administrative Zone small-scale farmers and therefore did not consider borrowers from informal credit sources. This limitation is attributable to the time constraint and the relatively higher asymmetry of information in informal circles. Therefore, the study was undertaken to meet its objectives within the above limitations.

1.7. Organization of the Thesis

This thesis is organized into five chapters. Chapter one provides the introduction, the background, statement of the problem, objectives, hypotheses of the study, the scope and limitations, and the significance of the study. Chapter two presents a review of the theoretical and empirical literature pertinent to the concern of the thesis. Chapter three describes the research methodology including a brief description of the study area, data collection procedures and analytical techniques. Chapter four reports the results of the study, and the discussion. Finally, a summary of the major findings, conclusion and recommendations are presented in Chapter five.

CHAPTER TWO: LITERATURE REVIEW

2.1. Definition of Credit

The Concise Mc Graw-Hill Dictionary of Modern Economics defines credit as, an exchange of goods and services, for the promise of a future payment. It also indicates that credit is necessary in a dynamic economy because of the time that elapses between the production of a good and its ultimate sale and consumption; credit thus bridges this gap. The risk in extending credit is the probability that future payment by the borrower will not be made (Greenwal & Associates, 1983).

Financial institutions are private or governmental organizations, which serve the purpose of accumulating funds from savers and channeling them to individual households, and business looking 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. Financial institutions that receive funds from savers and lend them to borrowers are called financial intermediaries. In a broad sense, the term, financial intermediary, is applicable to all financial institutions including commercial banks. These intermediaries pool money from savers and channel them to individuals, mutual saving banks, saving and loan associations, insurance companies, and pension trusts. In a narrow sense, however, it excludes commercial banks (Greenwald & Associates, 1983). Formal financial institutions can be defined as institutions that are regulated by central bank supervisory authorities, for licensing and credit policy implementations. They usually use legal documentation, or the legal system, to enforce contracts. On the other hand, informal financial intermediaries are those which are not licensed and regulated by the central banking system and they rarely use legal documentation or the legal system to enforce contracts.

2.2. The Need for Credit

Credit is the key means to have access to inputs in many development programs. This is particularly true for rural development because, so long as sufficient credit is not provided to support the development programs of the weaker sections of the society, the goal of development may not be achieved.

As a result of high population pressure in the rural areas of developing countries, such as Ethiopia, getting additional productive land is difficult, implying the need to improve farm level productivity through intensification. This involves, as pointed out by Tenaye (2010), the use of improved farm inputs such as fertilizers and improved seeds, besides improved tillage and husbandry practices. These inputs are not available on the farm and most farmers are not able to purchase them due to lack of finance. Moreover, most of the commercial inputs are expensive and hence, smallholder farmers cannot afford to buy them, from their own cash earnings. It is, therefore, generally acknowledged that agricultural credit to smallholder farmers can help to improve their farm productivity through use of improved farm inputs.

A number of researchers (Mark and Khandker, 2001; Chang, 2005) independently reported the requirement of credit facilities to small holders of less developed countries (LDCs) for production and consumption smoothing. Governments of LDCs and aid agencies have spent large amounts of money in this sector. The motivation has been the belief that loans are an essential part of various input packages, prescribed as part of the agricultural investment projects designed to introduce modern technologies and thus stimulate change and growth in agriculture in the third world.

Joseph and Robert, (2009) , reporting on a study of Thailand, also indicated that credit has impact, increasing consumption, agricultural investment, income growth (from business and

labor), and also a positive impact on wages, which is an important general equilibrium effect. Moreover, while income accrues during a limited period of the year, their expenses are spread throughout the year. This implies that, expenditures on inputs, have to be incurred, much in advance, of the income from resulting outputs. Producers meet these expenditures out of their past savings and when these savings fall short of the requirement, they borrow. Some studies of Ethiopia indicated that credit increased productivity in agriculture, enabling farmers to adopt improved technologies. For instance, the study by Tomoya and Tokshi, (2010) demonstrated that farmers who had access to credit were more likely to use improved seeds than those who had no access to credit.

According to Tenaye (1995), credit makes traditional agriculture more productive; through the purchase of farm equipment and other agricultural inputs, the introduction of modern irrigation system and other technological developments. Credit can also be used as an instrument for market stability. Rural farmers can build their bargaining power by establishing storage facilities and providing a transport system through credit. Credit plays a key role in covering the consumption deficits of farm households. This would, in turn, enable the farm family to work efficiently in agricultural activities. Credit can further be used as an income transfer mechanism to remove the inequalities in income distribution among the small, middle, and big farmers. Moreover, credit encourages savings and therefore, savings held with rural financial institutions could be channeled to farmers for use in agricultural production. Credit also creates employment opportunities for rural farmers.

Rural households in Ethiopia need credit for investment for a range of on-farm, off-farm and non-farm activities. Indeed, about ten years ago, it was estimated that 10 to 12 million families

required credit (IFAD, 2001). Most productive activities are seasonal and there is equally strong credit demand for consumption smoothing.

2.3. Theoretical Perspective of Credit Market

A major economic problem in developing countries is financial intermediation, the mobilization of capital from one group (savers/lenders) and its simultaneous allocation to meet the needs of another group (borrowers/entrepreneurs) (Christensen, 1993). Financial intermediation is critical for efficient capital mobilization and allocation. Financial intermediation can be performed through various forms of instruments; the three most important ones are equities (stocks), long-term (bonds), and short-term loans (credit) (Stiglitz, 1989). In most developing countries, because of the relative under-development of the first two forms of instruments, credit markets for short term loans become the major means of financial intermediation. The capital mobilization function of credit markets is, however, constrained by several factors. First when there is a lack of macroeconomic stability, as experienced by many Latin American countries during the 1970s and 1980s, people prefer to invest in fixed assets such as real estate and jewelry, or to save in foreign currencies, out of the country, instead of depositing local currencies in domestic institutions.

Secondly, savers are willing to deposit money in saving institutions only if they believe that they will be able to withdraw the money according to pre specified terms. The risk of bank closure and the availability of deposit insurance become important considerations for potential depositors. In many countries, governments establish banking regulations such as capital and reserve requirement to ensure the ability of banks to meet withdrawal demands.

Thirdly, government regulations create opportunities for political abuses. In some developing countries, for instance, the banking system is tightly controlled by government officials who

view it as a convenient source of cheap credit for their own expenditure projects and their favored political clients (Hanke and Walters, 1991). Thus, by offering mostly negative real interest rates to depositors, the banking system is not an attractive saving avenue for most people (McKinnon, 1973). The limitations of the formal banking system may be compensated for by informal credit arrangements that offer higher returns for depositors, but these informal arrangements are usually limited in scale and lack legal protection for the depositors.

In addition to overcoming the obstacles for capital mobilization, credit markets need to overcome the information problems associated with credit allocation (Stiglitz, 1989). First, because of the potential for default, lenders need to solve the selection problem; by screening loan applications based not just on how much interest the borrowers are willing to pay, but also the probability of default. Second are the enforcement problems related to the ability of lenders to ensure that the borrowers will actually repay the principal and interest, at specific times. Third, is that loan contracts need to include a variety of provisions other than interest rates. Non-price terms such as collateral and other kinds of restrictive covenants, such as market inter linkage, are often needed to create appropriate incentives for loan repayment.

2.4. Financial Institutions in Ethiopia

2.4.1. Formal Financial Sector

The formal financial institutions include the National Bank of Ethiopia (NBE), Commercial Bank of Ethiopia (CBE), Development Bank of Ethiopia (DBE), Construction and Business Bank (CBB), and the recently proliferating private commercial banks such as Dashen, Wogagen, Abyssinia, Awash International, and Nib-International; and the non-banking financial institutions such as the public and private insurance companies (Ethiopian Insurance Corporation (EIC), Nice, Nyala, Africa, and Awash).

In the Ethiopian context, farm credit has been made available through public financial institutions of which the Commercial Bank of Ethiopia (CBE) and the Development Bank of Ethiopia (DBE) are the two major providers of credit for inputs such as fertilizer, improved seed, herbicides, and farm tools. However, the DBE sharply reduced its supply of fertilizer loans in the early 1990s when its existence was threatened by massive default. The Development Bank of Ethiopia (DBE) stopped extending input credit in 1997. Currently, the major source of input credit is the CBE; there is also the limited participation of the emerging rural micro finance institution and the Amhara Credit and Savings Institution

The financial institutions, however, do not have contact with the farmers on an individual basis. Instead, the regional governments facilitate the loan provision, along with signed agreements with banks on the amount, duration and security of the loan. The amounts of the loans are estimated by each regional government, and in fact are estimated, based on information obtained from zonal- and district-level demand for the previous years. The loans are short-term credits, which should be paid back within one year; the banks use the regional government's budget as collateral.

Twenty seven micro-finance institutions have been officially recognized by the National Bank of Ethiopia (NBE, 2010). These institutions, deal directly with individual farmers, who fulfill the loan provision criteria set by their management. Though figures on the amount of credit they provide are not available, it is believed that these institutions play an important role in narrowing the gap between demand and supply of credit in rural areas. The advantage of these financial institutions is that, farmers can get loans in cash and use them to purchase the most limiting production resources.

Due to the large number of defaulters, the Agricultural and Industrial Development Bank (AIDB) and the Development Bank of Ethiopia (DBE), since the early 1990's have not been interested in extending input credit to farmers. Regions have now come into the picture of credit administration, to fill the gap. According to Mulat (1994), the majority of farmers in Ethiopia (over 80 percent) bought fertilizer on credit. Since the farmers were forced to re-pay their fertilizer loans immediately after harvest when the grain prices had dropped to very low levels because of oversupply, many farmers became defaulters. By the power vested in it, the National Bank of Ethiopia has licensed and has been regulating several financial institutions since the introduction of market reforms in 1994 (Proclamation No. 83/1994). By January, 2009, 16 commercial banks, nine insurance companies, 29 micro-finance institutions, and one development bank had been recognized by the National Bank (NBE, 2010). Both the number and branch offices of financial institutions increased after the liberalization, for instance, the number of commercial banks increased from 5 to 16 between 1995 and 2009. Similarly, the number of branch offices of the commercial banks increased from 202 to 681 in the same period, although 38.9 percent of the branch offices are found in and around the capital city, Addis Ababa (NBE, 2010).

The formal financial institutions 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. Table 1 presents a situation picture of the financial institutions in Ethiopia.

Table 1: Financial institutions in Ethiopia

Description	Number	Number owned by the state	Total number of branch offices
Commercial Banks	16	3	**649**
Development	1	1	**32**
Insurance Companies	12	1	**207**
Micro finance Institutions	**27**	-	**715**

Source: National Bank of Ethiopia (NBE), 2010.

2.4.1.1. Public Banks and Insurance Corporation

These are state-owned financial Institutions which include three banks and one insurance corporation namely: the Commercial Bank of Ethiopia, the Development Bank of Ethiopia, the Construction and Business Bank (CBB) and Ethiopian Insurance Corporation (EIC). One of the peculiar characteristics of these institutions is that all of them existed before the market reforms and thus, have long years of service, large fixed as well as working capital and widespread branch offices all over the country, as compared to other financial institutions.

2.4.1.2. Private Banks and Insurance Companies

These financial Institutions include those established by the private sector after liberalization of the market. Almost all of them are in the stages of growth and have limited number of branch offices. Currently, there are 13 private banks and 11 private insurance companies in Ethiopia.

2.4.1.3. Micro-Finance Institutions (MFIs)

The number of micro-finance Institutions (MFIs) operating in the country reached 27 at the end of the fiscal year 2008/2009 (NBE, 2010). Their total capital stood at Birr 1.7 billion, they mobilized deposits of Birr 2 billion, advanced loans of Birr 4.9 billion and total assets of Birr 6.6

billion, by the end of the fiscal year. Of the total MFI's, 14 were operating in Addis Ababa, seven in Oromiya, three in Amhara and the other three in different regional states. The biggest MFI's namely: Amhara Credit and Saving Institution, Dedebit Credit and Saving Institution and Oromiya Credit and Saving Institution are the first, second and third biggest MFIs ,respectively. (Appendix 2).

2.4.1.4. Oromiya Credit and Saving Share Company

The Oromiya Credit and Savings Share Company(OCSSCO) was established in 1995, formerly known as Oromiya Rural Credit and Saving Scheme Development Project. It was an offshoot of the Oromo Self Help Organization until August 4, 1997, when the project was phased out and the company established. At its establishment, the project had almost the same mandate as that of OCSSC today, and commenced its operations in four districts/branches of four Oromiya zones in February 1996. The branches were Kuyu of North Showa zone, Sinana-Dinsho of Bale zone, Hetosa of Arsi zone, and Shashamene of East Showa zone.

After one and a half years of operation, the Oromiya Rural Credit and Saving Scheme Development project was transformed into a company, following Proclamation Number 40/96 issued by the National Bank of Ethiopia, the licensing authority, to regulate the business of micro finance in the country. Through time, the company has increased its area and client outreach in the region. The company made an effort to expand its services to urban areas, but was not as effective as intended. As a result, 99 percent of its clientele are from rural areas; whereas only 1 percent is from the urban. Female clientele comprise 12 percent. The current outreach of the company is a clientele of 458,762, with a total loan capacity of 708 million Birr.

2.4.2. Informal Financial Sector in Ethiopia

According to Yohannes (2000), informal lending, in comparison to formal financial institutions, informal lending is by far, the most important source of finance for the rural and urban population. In recent years, the informal sector has continued to assume an increased prominence mainly due to the restrictive rules and regulations of the formal financial sector. The operations of the informal sector derive their rules and regulations from the country's culture and customs. Informal sector transactions are conducted on the basis of trust and intimate knowledge of customers. The common cultural background and the mutual obligations and fervent bonds of family and kinship, operate to promote the trust, accountability and moral responsibility that is lacking in the official banking system.

Besides, the informal lenders have easy access to information (at reasonable cost) about the borrowers, with whom they have social relations. This permits credit contracts to play a more direct role in enforcing repayment. Also, the fact that collateral is rarely used in the informal sector enables the sector to flexibly satisfy the financial needs that cannot be met by the formal financial institutions (Yohannes, 2000).

Nevertheless, the informal sector is not without its limitations. Despite its flexibility, rapidity and transparency of procedures, not only are there scarcities of loan funds for investment, but also, the interest rates charged on these loans are often exorbitant. The informal financial sector often embraces a wide group of individuals and institutions whose financial transaction are generally not subject to direct control by the country's key monetary and financial policy instruments. Individual economic entities in the informal sector include moneylenders, money-keepers, tradesmen, friends and relatives, and neighbours.

2.5. Empirical Studies on Loan Recovery and Defaults

Knowledge on the determinants of loan repayment is undoubtedly important because it provides information to the lender about the incentives that are amenable for the borrower to comply with repayment schedules. Empirical studies, in this connection, however are limited in Ethiopia, although recently, researchers are indicating interest and carrying out relevant studies. Indeed, there are several studies from various parts of the world on loan repayment issues, but the methodologies applied and the results are not, strictly, similar.

2.5.1. Loan Repayment Performance Globally

Several studies have analyzed loan repayment performance from different perspectives, upon which upcoming initiatives need to draw reference. Zeller (1996), investigated the determinants of repayment performance in credit groups. The study focused on the effects of program design, community and group characteristics on the repayment performance of groups, using a data set on groups from six different lending programs in Madagascar. The study found that socially cohesive groups pool risks by diversifying the members' asset portfolio so that their repayment performance is improved, even in communities with high-risk exposure. Indeed, the evolution of microfinance services all over the world has tended to focus on group programs.

Chirwa (1997), investigated the probability of agricultural credit repayment utilizing data from five agricultural development divisions in Malawi, using a probit analysis. The results, based on 1,237 sample farmer club members, indicated that, the availability of resources from crop sales and income transfers, the size of the club, the degree of diversification and the quality of information determined the probability of repayment. In contrast, other factors such as the amount of loan, gender of household head, and size of household and club experience were not statistically significant. Crop sales, income transfers, degree of diversification and quality of

information were positive and significant, while size of club was negatively related with the probability of repayment. However, the study only analyzed farmer's probability of loan repayment rather than, the actual performance of loan repayment. This may be a loss of information because the dependent variable that the study used was dichotomous.

A study of South Africa, carried out by Kuhn and Darroch (1999), using a multinomial logit model associating loan default to various factors, indicated that, clients with larger loans were less likely to default. This is because such loans tended to be associated with more (verifiable) collateral, lower administration costs per unit of credit and probably better quality information on potential investment returns.

The study by Nitin and Shui-Yan (2002) in the United States of America used the logit model to associate loan default to various factors. The study found that education and entrepreneurs' businesses located in the same zip code as the lending agency significantly influenced loan repayment at 5 and 1 percent error levels respectively. However, this study also used the binary model and did not consider the smallholder farms in rural areas.

Mosley (1995, cited in Belay, 2002) investigated what was called optimal incentives to repay in institutional lending to low income groups in Indonesia. The study identified three types of incentives and tried to find out the optimum levels of these incentives to optimize the payoffs of lenders and borrowers from the game. The optimum levels of these incentives were: incentives to the borrower to pay on time, consisting of a discount on interest payments, which are refunded when all payments due have been made; an incentive to the borrower consisting of a credit limit, which is expanded at the rate proportionate to repayment performance of the previous loan; and, incentives to the staff of lending institution to optimize their efficiency in monitoring and

securing repayment by making a portion of income dependent on some indicators of the performance of the institution, usually profit or loan recovery.

Oladeeba and Oladeeba (2008) examined socio-economic factors influencing loan repayment among small scale farmers in the Ogbomoso agricultural zone of Oyo State, Nigeria. The data used in this study was gathered from 100 farmers drawn from ten villages, and the Ordinary Least Square multiple regression was used. The study found that the amount of loan obtained by farmers, years of farming, experience with credit use and level of education were the major factors that positively and significantly influenced loan repayment while, age of farmers influenced loan repayment negatively and significantly. However, two limit Tobit model was applied in the current study because of the limitation of the Ordinary Least Square multiple regression cannot applied for the continues but limited dependent variable which otherwise will leads to biased and inconsistent parameter estimates.

The study carried out by Ugbomeh M. *et al.* (2008) in Nigeria, examined the determinants of loan repayment performance among women's self help groups. The study used ordinary least square (OLS) of multiple regression analysis to identify the factors affecting loan repayment. The results indicated that women as household heads, interest rates and household size, negatively and significantly affected the loan repayment performance of women farmers, while the price stability of farm proceeds and commitment to self help groups, positively and significantly affected the loan repayment of women farmers in self help groups in the area. However, like the previous study, this author also used the ordinary least square method and it did not consider important institutional and socio-economic variables those that more likely affect loan repayment performance rather than cost of loan recover, women as household heads,

interest rate, household size, price stability of farm proceeds, and commitment. In addition the study was limited its scope to only women's self help groups.

Roslan and Abdkarim, (2009) investigated the determinants of loan repayment among microcredit borrowers in Malaysia. The data, used in this study, was gathered through a survey of 2,630 respondents, drawn from 86 branches of the Agrobank in Malaysia. The study employed the probit and logit models to identify the main determinants that influence microcredit repayment. The study found that type of business activity; amount of loan; repayment period and training were the major factors that negatively and significantly influenced repayment. On other hand, the gender of the borrower influenced the probability of loan default positively. However, this study also used the binary model and did not consider the small holder farms that couldn't pay collateral in rural areas.

2.5.2. Loan Repayment Performance in Ethiopia

Ethiopia has had its share of agricultural loans over the years, and equally, its share of loan defaulters. A number of studies have investigated the phenomena. Abebe (1998) hypothesized that 21 socio-economic variables influenced the loan repayment performance of smallholder farmers, in Alemgena district, Ethiopia. Accordingly, his fitted multiple linear regression analysis revealed that factors such as experience in own farm, experience in credit use, proportion of area under teff and wheat production, annual farm revenue, number of draught oxen owned, ownership of livestock in the livestock unit, number of contacts with development agents and the location of the farmers from the development agents' centre were the most critical variables contributing to loan repayment. However, the current study, done in a different area used the two limit Tobit model to determine the factors affecting loan repayment among smallholder farmers to solve the limitation of multiple OLS method.

Bekele (2001) hypothesized 15 demographic, socio-economic, natural and institutional variables to explain the loan repayment performances of smallholder farmers in the Amhara and Oromiya regions of Ethiopia. His logit regression model results indicate that, timeliness of input supply, amount of formal loan per hectare, total grain production, participation in off-farm activities, total livestock owned in monetary terms, informal loan and yield loss due to bad weather, were significant, while the remaining eight variables, were less powerful in explaining the variations in the dependent variable. However, the study only analyzed farmer's probability of loan repayment rather than, the actual performance of loan repayment. This may be a loss of information because the dependent variable that the study used was dichotomous. Therefore, the current study has measured the performance of loan repayment among small holder farmers by using two limit Tobit model.

Belay (2002) examined the socio-economic factors influencing loan repayment in Diredawa, Ethiopia. Data was collected from 92 randomly selected borrowers, drawn from 23 savings and credit groups. The study used a binary logit model to analyze the factors influencing loan repayment performance of rural smallholder farmers. The Study included 12 explanatory variables in the empirical model, out of these, six were found to be statistically significant. Location of borrowers from lending institution, loan diversion, annual farm revenue and celebration of social ceremonies were highly important in influencing loan repayment performance among smallholder farmers. However, the current study used two limit Tobit model, to minimized inadequacies of a binary logit model because the dependent variable measure the performance of loan recovery rather than probability loan recovery.

Abreham (2002) examined the determinants of loan repayment performance among small scale enterprises with particular reference to the Development Bank of Ethiopia. The study used

the Tobit model and the findings revealed that having other sources of income, education, and work experience in related economic activity before the loan, and engaging in economic activities other than agriculture, are enhancing, while loan diversion, male borrowers , and extended loan repayment periods were undermining factors in the loan recovery performance of projects. This study used an appropriate model to analyze loan repayment performance, but, only investigated small-scale enterprises with particular reference to the Development Bank. However, the current study has examined smallholder farmers, who had no collateral.

Samsom (2003) investigated the financial arrangements and determinants of consumption credit use by rural households in Ethiopia. The data used in the study was gathered from 100 rural households drawn from eight Peasant Associations. A multivariate tool and, linear discriminate analysis was applied. The results reveal that the probability of loan repayment default was influenced by the gender of the borrower, the type of business activity engaged in, the amount of the loan, repayment period, and training at 5 percent level of significance. This study therefore focuses on determinant of consumption credit loan repayment performance in rural household while the current one investigated the performance of loan repayment among the small holder farmers who received loan for production purpose.

2.5.3. Methodological Issues

Various studies on loan repayment performance (for example, Chirwa (1997), Kuhn and Darroch (1999), Bekele (2001), Kebede (2002), Oladeeba and Oladeeba (2008) and Roslan and Abdkarim, (2009)) were variously analyzed using logit, probit, and Ordinary Least Square multiple regression models. Most of the studies conducted on modeling the determinants of loan repayments, have used dichotomous discrete choice models (Logit and Probit) where, the dependent variable is a dummy that takes a value of zero or one, depending on whether or not a

farmer has defaulted. However, Lynne *et al.* (1988) pointed out the possible loss of information if a binary variable is used as the dependent variable. In addition, binomial models explain only the probability that an individual made a certain choice (i.e. defaulted or has not defaulted); they fail to take into account the degree of loan recovery. The linear probability model (LPM), even though computationally and conceptually simpler and easier to use than the binary choice models, depends on the use of ordinary least squares (OLS) approach. Application of OLS to censored model however, inherently produces a heteroscedastic disturbance term (ε_i) and as a result, the standard deviations of the estimates are biased. These inadequacies are minimized with the use of the Tobit Model (Tobin, 1958). Therefore, this study used the two limit Tobit economic model to analysis factors affecting loan repayment performance.

CHAPTER THREE: METHODOLOGY

3.1. Conceptual Framework

It is conceptualized that loan repayment is influenced both directly and indirectly by various factors. Government policy, institutional and environmental factors are generally out of the control of farmers'. Government policy and environmental factors indirectly influence loan repayment and directly influence a farmer's efforts but, institutional factors influence directly and indirectly the loan repayment. Other factors such as demography and farmer attributes directly influence loan repayment. These relationships are presented in Figure 1 below.

The perceived or hypothesized relationships, however, need to be tested for authenticity, hence this study.

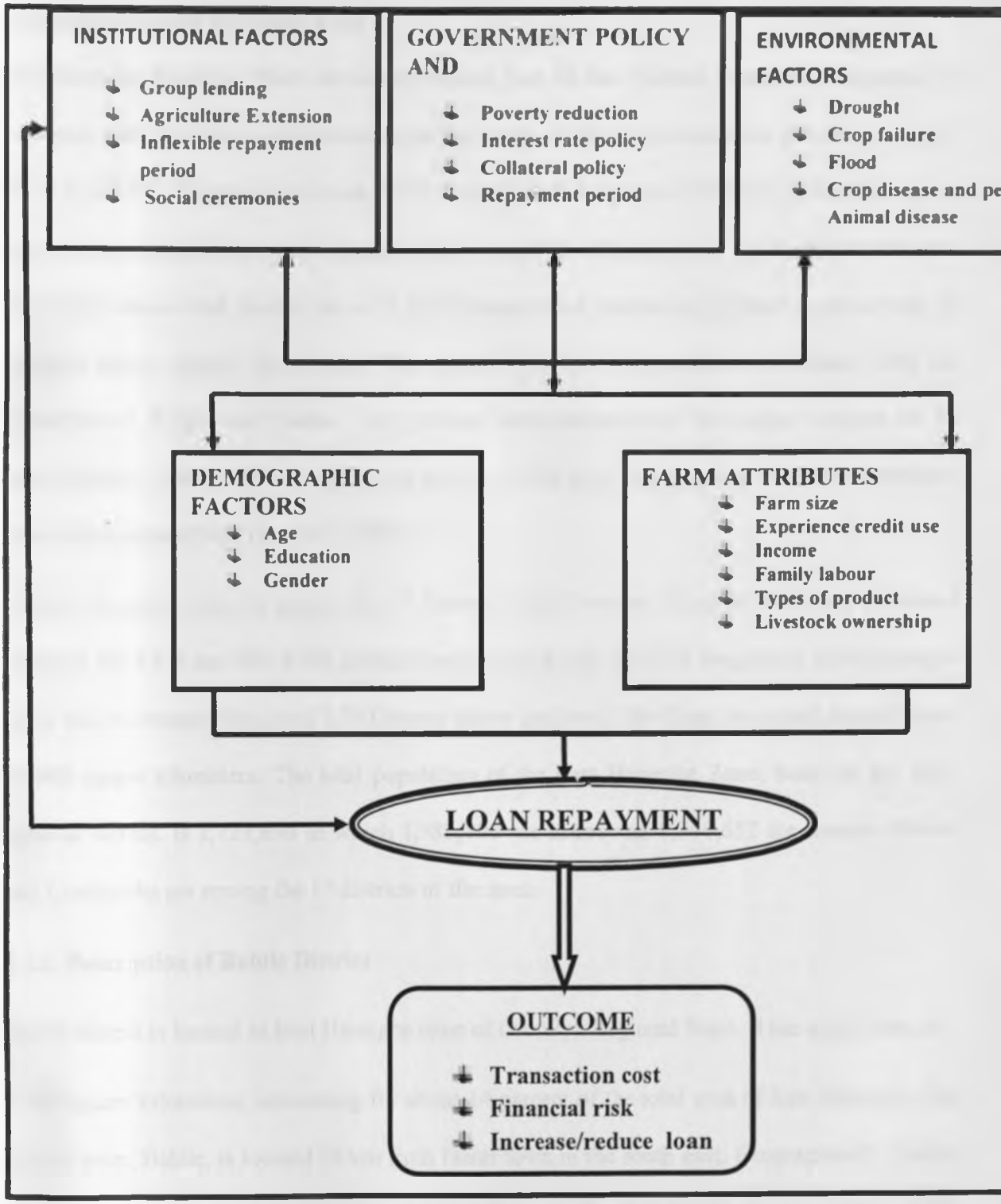

Figure 1 Conceptual Framework

Source: - Conceptual Idea Adopted from New Institutional Economics Perspectives on African Agricultural Development (Dorward and Omamo, 2009)

3.2. Description of the Study Area

The Oromiya Regional State lies in the central part of the Federal Democratic Republic of Ethiopia, with the large protrusions towards the south and the west directions. It extends from 3^0 40'N to 10^0 46' N latitude and from $34^0$08'E to $42^0$55'E longitude (OBPED, 2000). The region has an area of 363,007 square kilometers, and accounts for 32 percent of the country's land area. The region has a total border line of 5,672-kilometre and maintains physical contacts with all regional states, except the Tigray. The region also has international borderlines with the Republics of Kenya and Sudan. The political administration of the region consists of 17 administrative zones, 197 districts, and about, 5,968 and 483 peasant and urban dwellers association, respectively (RADSO, 2003).

Eastern Hararghe Zone is among the 17 Zones of the Oromiya Regional State and is located between 70° 32'N and 90° 44'N latitudes and 41°12'E and 42°53'E longitudes. East Hararghe Zone has an average altitude of 1,750 meters above sea level. The Zone has a total area of about 24,900 square kilometers. The total population of the East Hararghe Zone, based on the 2007 national census, is 2,723,850 of which 1,383,198 are males and 1,340,652 are females. Babile and Combolcha are among the 17 districts of the zone.

3.2.1. Description of Babile District

Babile district is located in East Hararghe zone of Oromiya Regional State. It has a total area of 3,169 square kilometers, accounting for about 14 percent of the total area of East Hararghe. The district town, Babile, is located 35 km from Harar town in the south east. Geographically, Babile district is located at 90°8'N latitude and 42°21'E longitude. It is among the 17 districts of the East Hararge Zone, and is bordered by Gursum and Feddis districts, and Harari and Somali Regional states.

Agro-ecologically, Babile district is characterized by plains and low lands. The altitude stretches between 950 and 2000 meters above sea level. Babile district falls under the lowland agro climatic zone, which covers 90 percent of total area, and the mean annual rain fall varies from 450 to 600 millimetres.

Babile district had a total population of about 93,674. Out of the total population 75,970 live in rural areas, 47,153 are male and 46,521 are females. Cultivable lands, pasture lands, and forest occupy about 21.1, 3.9, and 3.7 per cent, respectively. Agricultural production (both crop and livestock) is the main source of income and employment of the people. Mixed farming is also practiced and the most commonly produced cereals are sorghum and maize. Groundnuts are also an important crop grown in the area.

3.2.2. Description of Combolcha District

Combolcha district is located in the eastern part of Ethiopia, and is one of districts in the Eastern Hararghe Zone. Combolcha district is located 541 kilometers from Addis Ababa and the capital city of the district is located a distance of 18 kilometres away from Harar town in the north direction. The district is bounded on the south by Harari Region, to the southwest by Haramaya district, to the north by Dire Dawa and to the east by Jarso. The total area of the district is about 441.4 square kilometers, divided into 19 rural peasant associations and one urban kebele.

The total areas of Combolcha district in general, is categorized into two major climatic conditions: highland and lowland, which accounts for 74 and 26 percent respectively. The average annual rainfall varies from 600 to 900 mm. Combolcha district consists of diversified topographical features with an altitude varying from 1,600 to 2,400 meters above sea level.

According to information obtained from the District Agricultural and Rural Development Office (A & RDO), based on 2007 national census, the current population of the district is 140,769, comprising of 71,288 male and 69,481 females. About 93 percent of the total population (108,347) are living in the rural areas. The majority of the population in this district belongs to the Oromo ethnic group, and the dominant religion is Islam. The land coverage comprises of cultivated land (35.5 percent), grazing land (1.19 percent), forestland (7.79 percent), shrubs (16.66 percent), stony hills (13.5 percent), gully land (13.8 percent), and the rest is used for residential houses (11.56 percent). The major economic activities of the population in the study area are domestic crop production and animal husbandry. From the main economic earning of the area, khat ranks the first, followed by cereals and vegetables. From cereal production maize constitutes (50 percent) followed by sorghum (45 percent) and wheat (5 percent).

According to information obtained from the district Agricultural and Rural Development Office (ARDO, 2005), out of the total areas covered by perennial crop (12,340 ha), 80 percent is covered by the khat crop, and farmers commonly use irrigation for vegetable and khat production. Intercropping cereals with khat is the common farming system in the study area.

Agricultural production in both districts is basically subsistence, as most farmers often have inadequate resources for the development of agriculture. The farmers however, are trying to commercialize but the severe shortage of financial resources to purchase productive agricultural inputs is a drawback.

The Oromiya Credit and Savings Share Company, extends credit and savings facilities to farming households in the two districts in order to narrow the gap between the capital required and the capital that the households possess, for the improvement of agricultural technologies that

would increase production and productivity. However, there are there are severe loan repayment problem in both districts.

Figure 2 below presents the Map of Eastern Hararghe zone, showing Combolcha and Babile districts

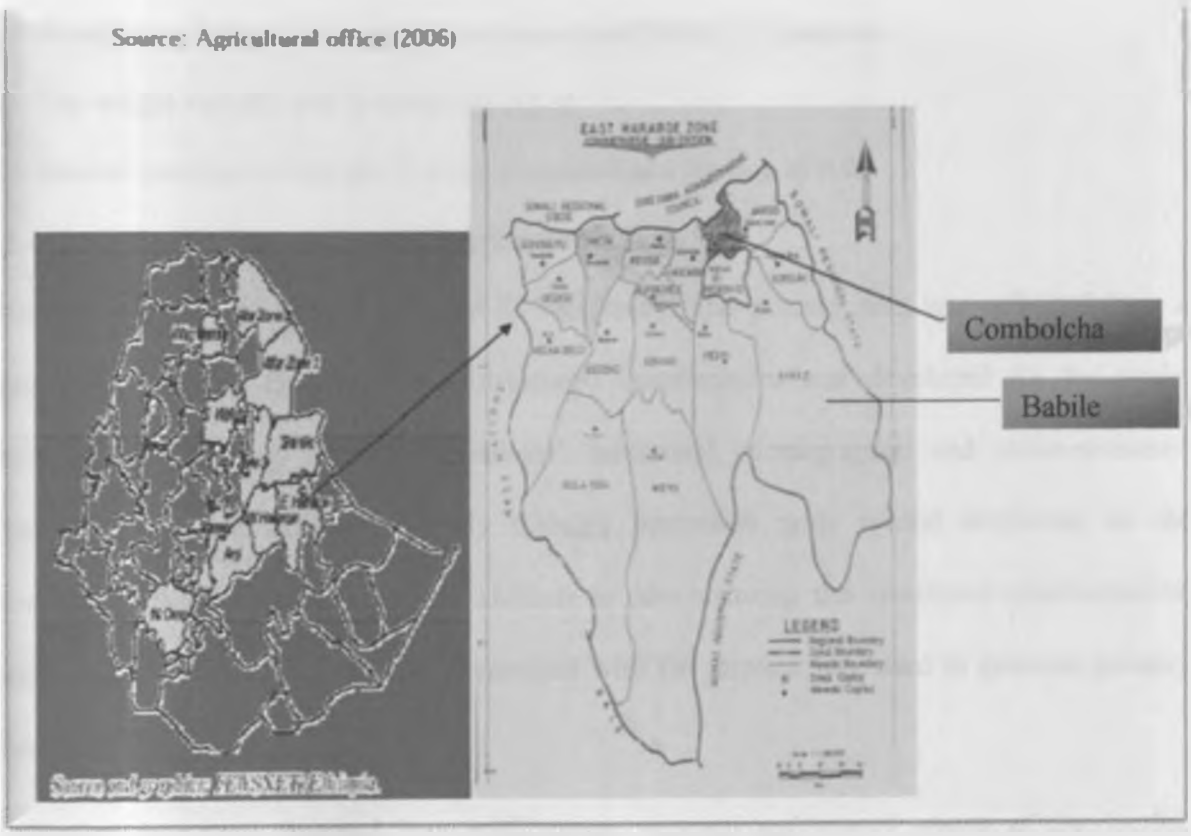

Figure 2 Map of Eastern Hararghe zone, Combolcha and Babile district

3.3. Sample Size

The study used a random sample, selected from smallholder farmers who received loans in the 2008/09 fiscal year. The sample size was estimated using Cochran's (1963:75) method. This study used a 95 percent confidence interval (Z=1.96) for a two tail test, and assuming that P=0.1, with an allowable error of 5 percent. Therefore, based on this formula, the sample size is 140.

$$n = \frac{Z^2(p)(q)}{d^2}$$

n = Sample size

Z = Statistical certainty, related to the error risk, equals 1.96 for an error risk of 5 percent level of significance

p = Smallholder farmers who may access loan from OSCSC (10 percent)

q = The weight variable and is computed as 1-p

d = Desired precision or margin of error, expressed as a fraction of 0.05

3.4. Data Needs, Sources, and Collection Procedures

Primary and secondary data were used for this study. The primary data was collected from a sample of borrower farmers, and a structured questionnaire was developed for the study. Information pertaining to the respondents' household, demographic and socio-economic characteristics were obtained directly through interviews with formal borrowers in the smallholder farmer communities. In addition to administering the structured questionnaires, personal observation and informal discussions with the farmers was used to generate primary data.

Secondary data were obtained from publications, seasonal and annual reports of the district, zonal and regional offices of the Ministry of Agriculture and Rural Development, the Development Bank of Ethiopia, Micro Finance Institutions, and other related organizations.

Multistage sampling procedure was used. First, the Oromiya region was selected purposively, out of the nine regions of Ethiopia. This is because of the Oromiya region covers a proportionally large part of the country with 36.7 percent of the total population. In addition, this region has low loan recovery rate as compared to other regions. Thus, this region represents the

loan delinquency issue well. Oromiya region is sub divided into 14 zones and East Hararghe was further selected using random sampling. East Hararghe zone is also sub divided into 23districts. These districts are mainly categorized into two agro ecological zones, highland and lowland. One district was randomly selected from each agro-ecological zone. Therefore, for this study, Babile and Combolcha districts were randomly selected to represent the lowland and highland areas, respectively.

In the 2008/2009 fiscal year, there were 12 credit centers in the Combolcha and 8 credit centers in Babile. These credit centers were located in 17 and 21 Peasant Associations, in Combolcha and Babile respectively. Out of a total 276 borrowers in Comobolcha and 270 borrowers in Babile, 70 borrowers from each district were selected.

As indicated in Table 2, cluster sampling was employed, in order to select specific households, which received a loan from the Oromiya Saving and Credit Share Company in the 2008/2009 fiscal year. To select specific households, the researcher first classified the households which had received loans according to gender and credit centers, and then proportionally selected the sample randomly from both agro-ecological zones.

Table 2 List of credit centers and number of farm households selected for the survey

Agro ecological zone	Credit center	Number of Borrowers		Number of sample		Total sample
		Male	Female	Male	Female	
	Center 22	32	31	8	8	16
	Center 57	43	31	11	8	19
	Center 66	6	1	2	-	2
	Center 52	8	3	2	1	3
	Center 44	4	16	1	4	5
	Center 34	11	7	3	2	5
	Center 32	8	2	2	-	2
Combolcha	Center 68	2	8	-	2	2
	Center 50	4	4	1	1	2
	Center 69	4	5	1	1	2
	Center 64	16	11	4	3	7
	Center 58	4	15	1	4	5
	Center 01	14	9	4	2	6
	Center 02	18	13	5	3	8
	Center 31	17	10	4	3	7
	Center 48	23	16	6	4	10
Babile	Center 13	14	13	4	3	7
	Center 55	32	22	8	6	14
	Center 09	17	10	4	3	7
	Center 12	26	66	7	4	11
Total		303	243	78	62	140

Source: own computation

3.5. Method of Data Analysis

3.5.1. Descriptive Statistics

Quantitative data was analyzed using descriptive statistics such as mean, standard deviation and percentage, in order to investigate the relative importance of major variables that, it had been hypothesized, influenced the loan repayment performance of small holder farmers.

3.5.2. Empirical Models

One of the objectives of this study was to select the variables which most significantly distinguished between non-defaulters and defaulters of agricultural loans, from a set of personal and socio-economic variables which, it was hypothesized, influenced repayment behavior. For this purpose, the two-limit Tobit model was used.

There were several situations where the variable to be modeled was limited in its range. Because of the restrictions placed on the values taken by the regressand, such models can be called limited dependent variable regression models. When information on the regressand is available for some observations, using OLS may result in a biased and inconsistent parameter estimates, even asymptotically. The bias arises from the fact that, if we consider only the observable or n_1 observations (that is, only observations for which the values of the dependent variable are observed) and omit the others, there is no guarantee that the expected value of the error terms, ($E(u_i)$), will be necessarily zero. And without $E(u_i) = 0$ we cannot guarantee that the OLS estimates will be unbiased. It is intuitively clear that if we estimate a regression line based on the n_1 observations only then, the resulting intercept and slope coefficients, are bound to be different from that where all the (n_1+n_2) observations were taken into account (Greene, 2000).

There are three types of regression models, under the limited dependent variables models. These are Censored or Tobit regression, Truncated regression and, Sample selected regression models. Inferring the characteristics of a population from a sample drawn from a restricted part of the population is known as truncation. A truncated distribution is the part of untruncated distribution that is above or below, some specified value (Greene, 2000). A sample in which information on the regressand is available only for some observation is known as censored sample.

The use of Tobit models to study censored and limited dependent variables has become increasingly common in applied social science research over the past two decades (Smith and Brame, 2003). Tobit is an extension of the Probit model and, it is one approach for dealing with the problem of censored data (Johnston and Dinardo, 1997).

In this study, the value of the dependent variable is the repayment ratio, and it has been computed as the ratio of the amount of loan repaid, to the total amount borrowed from formal sources of credit. Thus, the value of the dependent variable ranges between 0 and 1 and a two-limit Tobit model has been chosen as a more appropriate econometric model.

The two-limit Tobit was originally presented by Rossett and Nelson (1975) and discussed in detail by Maddala (1992) and Long (1997). The model derives from an underlying classical normal linear regression and can be represented as:

$$y^* = \beta' x_i + \varepsilon_i, \qquad (1)$$

$$\varepsilon \sim N[0,\sigma^2].$$

$$Y_i = \begin{cases} L & \text{if } Y^* \le L \\ Y^* = \beta X + \varepsilon_i & \text{if } L < Y^* < U \\ U & \text{if } Y^* \ge U \end{cases} \qquad (2)$$

Where,

Y_i = the observed dependent (censored) variable, in our case repayment rate (ratio of amount repaid to the amount borrowed)

Y_i^* = the latent variable (unobserved for values smaller than 0 and greater than 1).

X_i = is a vector of independent variables (factors affecting loan repayment and intensity of loan recovery)

L and U are threshold values (L =0 and U =1)

β_i = Vector of unknown parameters

ε_i = Residuals that are independently and normally distributed with mean zero and a common variance σ^2, and i= 1, 2,...n (n is the number of observations).

By using the two-limit Tobit model, the ratio of repayment was regressed on the various factors hypothesized to influence loan repayment performance of smallholder farmers in the study area.

The log likelihood function for the general two-limit Tobit model can be given as follows Maddala (1992) and Long (1997):

$$\log L = -\frac{1}{2}\sum_{j\varepsilon c} w_j\left[\left(\frac{y_i - x\beta}{\sigma}\right)^2 + \log 2\pi\sigma^2\right]$$
$$+ \sum_{j\varepsilon L} w_j \log \Phi\left(\frac{y_{Lj} - x\beta}{\sigma}\right)$$
$$+ \sum_{j\varepsilon R} w_j \log\left[1 - \Phi\left(\frac{y_{Rj} - x\beta}{\sigma}\right)\right] \qquad (3)$$
$$+ \sum_{j\varepsilon I} w_j \log\left[\Phi\left(\frac{y_{2j} - x\beta}{\sigma}\right) - \Phi\left(\frac{y_{1j} - x\beta}{\sigma}\right)\right]$$

Where, C's are point observations, L's are left censored observations, R's are right-censored observations, and I's are intervals. The Φ is the standard cumulative normal distribution, and the w_j is the normalized weight of the j^{th} observation.

The Tobit coefficients do not directly give the marginal effects of the associated independent variables on the dependent variable. But their signs indicate the direction of change in the

probability of being a non-defaulter and the marginal intensity of loan recovery, as the respective explanatory variable change (Amemiya, 1984; Goodwin, 1992; Maddala, 1985, cited in Amare, 2006).

The Tobit model has an advantage in that; its coefficients can be further disaggregated to determine the effect of a change in the i^{th} variable, on changes in the probability of being non-defaulter (Mc Donaled and Moffit, 1980) as follows:

1. The change in the probability of repaying the loan as an independent variable X_i changes is:

$$\frac{\partial \Phi(\delta)}{\partial Xi} = \phi(\delta)\frac{\beta_i}{\sigma} \qquad (4)$$

2. The change in intensity of loan recovery with respect to a change in an explanatory variable among non-defaulters is:

$$\frac{\partial E(Y_i/U > Y_i^* > L, X)}{\partial X_i} = \beta_i\left(1 + \frac{\delta_L\phi(\delta_L) - \delta_U\phi(\delta_U)}{\Phi(\delta_U) - \Phi(\delta_L)} - \left[\frac{\phi(\delta_L) - \phi(\delta_U)}{\Phi(\delta_U) - \Phi(\delta_L)}\right]^2\right) \qquad (5)$$

3. The marginal effect of an explanatory variable on the expected value of the dependent Variable is:

$$\frac{\partial E(Y/X_i)}{\partial X} = \beta i\left(\Phi(\delta_u) - \Phi(\delta_L)\right) \qquad (6)$$

Where,

X_i = explanatory variables,

$\Phi(\delta)$ = the cumulative normal distribution

$\delta = \frac{\beta_i X_i}{\sigma}$ = the Z-score for the area under normal curve

βi = a vector of Tobit maximum likelihood estimates

σ = the standard error of the error term.

$$\delta_L = \frac{L - X_i\beta}{\sigma}$$

$$\delta_U = \frac{U - X_i\beta}{\sigma}$$

L and U are threshold values (L =0 and U =1)

ϕ and Φ are probability density and cumulative density functions of the standard normal distribution, respectively.

3.6. Variable Specification and Expectation

Table 3 presents a summary of the expectation model results and hypothesis test. In order to determine whether to reject or fail to reject, we compared t calculated[1] to t critical [2](t tabulated). If t calculated is greater than t critical, then the H_0 will be rejected; that means, the explanatory variables significantly influence the dependent variable.

[1] t calculated= $\frac{\beta i}{SE}$

[2] t critical= $t_{0.025}$ df=1.96 df: degree of freedom

Table 3 Summary of expectation and hypothesis test

Variable	Expectation	Hypothesis
AGRO-ECO	+ve	$H_0: \beta_1=0,\ H_1: \beta_1>0$
AGE	-ve or +ve	$H_0: \beta_2=0,\ H_1: \beta_2\neq0$
GENDER	-ve or +ve	$H_0: \beta_3=0,\ H_1: \beta_3\neq0$
EXPCREDIT	+ve	$H_0: \beta_4=0,\ H_1: \beta_4>0$
FAMSIZE	-ve or +ve	$H_0: \beta_5=0,\ H_1: \beta_5\neq0$
OFF-FARM	+ve	$H_0: \beta_6=0,\ H_1: \beta_6>0$
PROLOSS	-ve	$H_0: \beta_7=0,\ H_1: \beta_7<0$
INFORCRED	-ve	$H_0: \beta_8=0,\ H_1: \beta_8<0$
MEMEXTE	+ve	$H_0: \beta_9=0,\ H_1: \beta_9>0$
DISCRESOU	-ve	$H_0: \beta_{10}=0,\ H_1: \beta_{10}<0$
SOCCEREM	-ve	$H_0: \beta_{11}=0,\ H_1: \beta_{11}<0$
NUMTEASS	+ve	$H_0: \beta_{12}=0,\ H_1: \beta_{12}>0$
TLU	+ve	$H_0: \beta_{13}=0,\ H_1: \beta_{13}>0$
LOANINCOM	-ve	$H_0: \beta_{14}=0,\ H_1: \beta_{14}<0$
LANDSIZE	+ve	$H_0: \beta_{15}=0,\ H_1: \beta_{15}>0$
EDU	+ve	$H_0: \beta_{16}=0,\ H_1: \beta_{16}>0$

Source: Author

The dependent variable of the econometric model for this study is the proportion of formal loans repaid during the specified repayment period. This was calculated as the ratio of the total amount of credit repaid to the total amount due. Its value ranged between 0 and 1. Those farmers who borrowed but did not repay the full amount of money that they had borrowed are considered as complete defaulters (i.e. the value of the repayment ratio in this case is zero), and those who had repaid only partly are still defaulters. On the other hand, those farmers that repaid back all the money that they had borrowed within the stated time are considered non-defaulters.

Based on the literature review and the discussions held with stakeholders, the explanatory variables selected for this study were broadly categorized under socioeconomic, institutional and natural factors. A brief description of the explanatory variables selected for this study and their likely influence on the loan repayment performance is presented next.

Agro-ecological zone differentials (AGRO-ECO): this variable takes a value of 1 if the area belongs to an adequate rain receiving agro-ecology or Combolcha district and 0, otherwise (if the agro ecology of the area is moisture deficit). An agro ecological difference may influence the rate of loan recovery due to its direct relation to the farmers' economic situation. For instance, farmers in districts with sufficient rainfall districts produce different types of food and cash crops, and thus, have diversified sources of income. Therefore, farmers who were living in districts with adequate rainfall were expected to have lower loan default rates as compared to those farmers who were living in moisture deficit districts. The hypothesis that an agro ecological zone does not significantly affect loan repayment will fail to be rejected if the beta (β) of AGRO-ECO is zero.

Age of the borrower (AGE): This was defined as the period from the respondent's birth to the time of the interview and was measured in years. Through time, household heads acquire experience in farming and/or credit use. Moreover, older borrowers may accumulate more wealth than younger ones. Therefore, this variable is hypothesized to have positive impact on the loan repayment performance of respondents. However, if they have insufficient labor within their households, given that older household heads in rural areas are in a disadvantaged position when it comes to undertaking the heavy physical labor required in agriculture, then, each additional unit increase in age after some point would thus add less to household income and may even reduce household income leading to low repayment performance. The hypothesis that the age of the borrower does not affect loan repayment will fail to be rejected if the beta (β) of AGE is zero.

Gender of the household head (GENDER): This is a dummy variable in the model, which takes a value of 1 if the household head is male and 0, if the household head is female. Gender differentials in the farm households play a significant role in the economic performance of a

given household. Gender differentials can be related to access to credit and indeed, one may expect that female-headed households are less experienced in formal credit and hence will be defaulters because they know little about the consequences of loan defaulting. The opposite expectation may be that, female borrowers tend to be more loyal to the lenders than male borrowers. This may arise from the fact that females are more responsible for childcare and home management and hence they may be more concerned than males, about the possible undesirable consequences arising from the default. Therefore, it is expected that the Gender of the household head would have either a positive or a negative impact on the loan repayment performance of the respondents. The hypothesis that gender of the household head does not affect loan repayment will fail to be rejected if the beta (β) of GENDER is zero.

Number of livestock owned (TLU): This variable, was defined in terms of Tropical Livestock Unit (TLU) and may serve as a proxy for the capacity to bear the risks of using credit for the purchase of new technology such as fertilizer, it will also capture the wealth effect. Livestock may also serve as a proxy for oxen ownership, which is important for farm operations. It is expected that this variable would have a positive influence on the loan repayment performance. The hypothesis that the number of livestock owned does not affect loan repayment will fail to be rejected if the beta (β) of TLU is zero.

Education level (EDU): This is a dummy variable, which takes a value of 1 if the household head is literate and 0 if illiterate. If the farmers can read and write, they increase their ability to obtain, process, and use information. For example, literate farmers may seek information on prices more than the illiterates ones and consequently, will be able to sell their produce at reasonable prices. Moreover, education may enable farmers to be more aware of the importance of formal loans and hence may reduce willful default. Therefore, all things being equal,

education is expected to reduce the rate of loan default. The hypothesis that the education level does not affect loan repayment will fail to be rejected if the beta (β) of EDU is zero.

Experience in formal credit use (EXPCREDIT): this is the number of years during which he respondents have borrowed from formal credit institutions. Farmers, who have experience in formal credit use, develop a reputation for creditworthiness and become trusted clients of micro finance institutions, therefore, they are more likely to pay their debt on the due date, as opposed to the inexperienced farmers. The hypothesis that experience in formal credit use does not affects loan repayment will fail to be rejected if the beta (β) of EXPCREDIT is zero.

Family size (FAMSIZE): Refers to the number of people who eat from the same source/pot. The larger the family size, the more the labor force available for production purpose. Therefore, there is the possibility of having more alternative sources of income to overcome credit risks (Schereiner & Nagarajan, 1997). Based on this assumption, families with sufficient labor-force would be expected to have a low probability of defaulting. On the other hand, large family size may imply insufficiency in terms of food consumption because; large households consume more than do small households. This is usually true if the dependency ratio of the household is large. Therefore, the effect of family size, on formal loan repayment capacity may be indeterminate a priori. The hypothesis that family size does not affect loan repayment will fail to be rejected if the beta (β) of FAMSIZE is zero.

Off-farm activities (OFF-FARM): This is a dummy variable, which takes a value of 1 if any member of the household was involved in off-farm activities and 0, if not. Off-farm activities generate additional sources of income for smallholder farmers. The cash generated from these activities would back up the farmers' income and enable them to settle debt even during bad harvesting seasons when the repayment period coincides with low agricultural prices. Hence,

households involved in off-farm activities tend to be more capable of repaying loans in time. Therefore, off-farm income is hypothesized to have positive impact on loan repayment rate. The hypothesis that an off-farm activity does not affect loan repayment will fail to be rejected if the beta (β) of OFF-FARM is zero.

Land holding (LANDSIZE): Refers to the total farm size (in hectares) owned by the family. A farmer with more hectares of land is expected to be better off in terms of loan repayment performance. This is because, if augmented with other factors of production, large farm size will give higher production that will enable the borrower to repay his/her loan. Therefore, this variable is expected to have a positive relation with the dependent variable. The hypothesis that land holding does not affect loan repayment will fail to be rejected if the beta (β) of LANDSIZE is zero.

Animal disease and crop failure (PROLOSS): This is a dummy variable, which takes a value of 1 if there is animal disease or crop failure as happened in the 2008/2009 production year and 0, otherwise. The farmer's crop loss or animal loss leads to a reduction of the total income generated from agriculture. Therefore, animal disease and crop failure are expected to reduce a borrowers' capacity to repay their loans in time. The hypothesis that animal disease and crop failure do not affect loan repayment will fail to be rejected if the beta (β) of PORLOSS is zero.

Borrowed from informal sources (INFORCRED): This is a dummy variable which takes the value of 1 if the farmer received a loan from an informal source such as relatives, shopkeepers and other money-lenders, and 0, if not. A household receiving a loan from informal sources would tend to be a defaulter of the formal institution as compared to those households which, do not borrow from informal services. The hypothesis that borrowing from informal sources does not affects loan repayment will fail to be rejected if the beta (β) of INFORCRED is zero.

Distance from credit source (DISCRESOU): This is measured by the time that it takes the household to reach the credit source. Borrowers residing near the lending institution have a location advantage and can contact the lender more easily and frequently than those who live in more distant locations. Therefore, location advantage is expected to increase the loan repayment performance. This variable is measured in terms of the walking time required to travel from the respondent's residence to the lending institution. The hypothesis that distance from credit source does not affect loan repayment will fail to be rejected if the beta (β) of DISCRESOU is zero.

Celebration of social ceremonies (SOCCEREM): These are ceremonies celebrated occasionally and include weddings, funeral ceremonies, engagement, circumcision, Iddir/Iqqub and others. The expenses incurred during these ceremonies are sometimes large, relative to the borrowers' economic status. If a person has celebrated one or more of these, celebrations of social ceremonies takes a value of 1, and zero if they have not taken part in a social celebration. As this variable can be a proxy for the use of income for non productive purposes, it is expected to have a negative impact on the loan repayment performance. The hypothesis that celebration of social ceremonies does not affect loan repayment will fail to be rejected if the beta (β) of SOCCEREM is zero.

Contact with development agents (NUMTEASS): This is the number of days per month that a farmer contacts a development agent for technical guidance. The higher the linkage between farmers and development agents, the more the information flow and the technological (knowledge) transfer from the latter to the former. Farmers who have frequent contact with extension workers are more likely to have up-to-date information on production technologies that would help them to increase their production and productivity and thus generate better income. Thus, those farmers who have frequent contacts with development agents are likely to settle their

debts on a more timely basis, as opposed to those who have non or few contacts. The hypothesis that contact with development agents does not affect loan repayment will fail to be rejected if beta (β) of NUMTEASS is zero.

Ratio of amount of loan received to income (LOANINCOM): This is the ratio of the amount of loan received to the total income. High ratio means the farmer received a high loan relative to their economic status. Thus, for farmers who have high ratio, we expect low repayment rates in comparison to the low ratio of the amount of loan received to income. The hypothesis that ratio of amount of loan received to income does not affect loan repayment will fail to be rejected if beta (β) of LOANINCOM is zero.

3.7 Preparation of Variables in the Empirical Model

3.7.1 Multicollinearity Diagnosis

As already discussed, the two-limit Tobit model was used to identify the determinants of the loan repayment performance in the study area. Prior to running the Tobit model, the hypothesized explanatory variables were checked for the existence of multicollinearity. Multicollinearity problem arises when at least one of the independent variables is perfect or is an exact linear relationship of the other independent variable (Gujarati, 2003). The existence of multicollinearity might cause the estimated regression coefficients to have the wrong signs and smaller t-ratios that might lead to drawing the wrong conclusions. Therefore, it was important to check whether serious problems of multicollinearity existed among and between the potential continuous and discrete explanatory variables, of the model estimation.

The technique of variance inflation factor (VIF) was employed to detect the problem of multicollinearity for continuous explanatory variables (Chatterjee and Price, 1991). If R_i^2 is the square of the multiple correlation coefficient that results when one explanatory variable (x_i) is

regressed against all the other explanatory variables, VIF= $(1-R_i^2)^{-1}$. Likewise, contingency coefficients were computed to check the existence of multicollinearity problem for discrete explanatory variables, which assumes a value between 0 and 1. The contingency coefficients are computed as follows:

$$C = \sqrt{\frac{\chi^2}{N + \chi^2}}$$

Where, C= Coefficient of contingency

χ^2 = Chi-square random variable and

N = total sample size.

Value of VIF greater than 10 is often taken as a signal for the existence of multicollinearity problem in the model. Similarly, the decision rule for contingency coefficients is that if contingency coefficients approach 1, there is a problem of association between the discrete variables.

Tables 4 and 5 below present the results of the tests for multicollinearity in the variables.

Table 4 Variance inflation factor for continuous explanatory variables

Variables	**Variance inflation factor (VIF)**	R_i^2
TLU	2.29	0.563
LANDSIZE	2.09	0.522
FAMSIZE	1.71	0.415
AGE	1.59	0.371
EXPCREDIT	1.51	0.338
NUMTECASS	1.49	0.329
LOANINCOM	1.28	0.219
DISCRESOU	1.14	0.123

Source: Computed from survey data

Table 5 Contingency coefficients for discrete explanatory variables

	AGRO ECO	GEN DER	OFFAR M	INFOC RED	MEME XTE	EDU	SOCCE REM	PROL OSS
AGRO-ECO	1.000	0.086	0.114	0.000	0.038	0.108	0.089	0.144
GENDER		1.000	0.083	0.181	0.024	0.243	0.123	0.009
OFF-FARM			1.000	0.068	0.063	0.215	0.224	0.349
INFOCRED				1.000	0.017	0.053	0.119	0.141
MEMEXTE					1.000	0.187	0.023	0.036
EDU						1.000	0.325	0.305
SOCCEREM							1.000	0.464
PROLOSS								1.000

Source: Computed from survey data

Based on the VIF and contingency coefficient results, the data were found to have no serious problem of multicollinearity and therefore the continuous and discrete explanatory variables were retained in the model.

3.7.2 Assessing the Goodness of Fit and Heteroscedasticity

The goodness of fit determines the accuracy with which a model approximates the coefficients of the respective variable. Likelihood Ratio (LR) Chi-Square test shows that at least one of the predictors' regression coefficients is not equal to zero. The chi square of the regression model is 150.31 which is significant at less than 1 percent level of probability.

One of the assumptions in regression analysis is that the errors, u_i have a common (constant) variance σ^2. If the errors do not have a constant variance we say they are heteroscedastic (Maddala, 1992). Though the estimated parameters of a regression in which heterosecadesicity is present are consistent, they are inefficient. The Breuch-Bagan (BP) test has shown no heteroscedasticity problem in the model.

CHAPTER FOUR: RESULTS AND DISCUSSION

This chapter presents the results from the descriptive and econometric analyses. The descriptive analysis made use of such tools as mean, percentage, standard deviation and frequency distribution. In addition, the t- and Chi-square statistics were employed to compare defaulters with the non-defaulters group with respect to some explanatory variables. Econometric analysis was carried out to identify the most important factors that affect the loan repayment performance and to measure the relative importance of significant explanatory variables on loan repayment.

4.1. A Comparison of Characteristics of Defaulters and Non-Defaulters in East Hararghe

4.1.1. Socio-economic and Institutional Characteristics Among Defaulters and Non Defaulters

Table 6 presents a summary of socio-economic and institutional factors (continuous variables) among defaulter and non defaulter for all the respondents. The hypothesis that socio-economic and institutional characteristics between defaulters and non defaulters are similar was rejected in only some cases, when t calculated[3] was greater than t critical, as presented in Table 6 below.

$$t = \frac{\overline{X}_1 - \overline{X}_2}{s_{\overline{X}_1 - \overline{X}_2}}$$

Where,

$$s_{\overline{X}_1 - \overline{X}_2} = \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}.$$

Table 6 Socio-economic and institutional characteristics among defaulters and non defaulters for the entire respondent (continuous variables)

	Defaulter		Non defaulter					Total sample	
					t. value	p. value	Test decision		
Characteristics	N=100		N=40					N=140	
	Mean	**sta. dev**	**Mean**	**sta.dev**				**Mean**	**sta. dev**
Age	36.81	8.44	36.43	10.60	0.23	0.82	Fail to reject	36.70	9.07
Experience Credit	3.05	1.75	4.05	2.12	-2.87	0.00	Reject	3.34	1.91
Family size	6.04	1.94	5.58	2.21	1.20	0.21	Fail to reject	5.91	2.00
Ceremony expense	880.80	1857.73	633.75	2199.17	0.67	0.50	Fail to reject	810.21	1956.41
Distance from credit	86.18	43.74	38.83	28.40	6.33	0.00	Reject	72.65	45.28
Contact with development agent	1.04	1.30	2.23	2.09	-4.04	0.00	Reject	1.38	1.65
Amount received	1758.00	899.18	1627.50	818.69	0.80	0.43	Fail to reject	1720.71	876.02
TLU	2.10	1.82	3.56	3.10	-3.46	0.00	Reject	2.52	2.34
Total income	9596.35	6712.57	16616.05	11843.83	-4.42	0.00	Reject	11601.98	9032.11
Total land size	1.10	0.42	1.64	1.52	-3.27	0.00	Reject	1.25	0.91

Source: Computed from the survey data

Only five different prevailing institutional and socio-economic platforms considered between defaulters and non defaulters were found to be significant. These were experience with credit, distance from credit, and contact with development agents, tropical livestock unit, total income and total land size, at 5 percent level of significance. Those found not to be significant were age, family size, ceremony expenditure and amount of loan received.

On average, the formal credit experience of the household heads for all the respondents was 3.34 years, while independently average years of formal credit experience; were 3.05 and 4.05 years for defaulters and non defaulter respectively. The results indicate a significant difference between the average formal credit experiences of the two groups at less than 1 percent level of probability. This indicates that the farmers who had more experience with formal credit were more likely to repay their loans than, those with less credit experience.

Land is by far the most important resource in agriculture. The fertility status, location and other attributes of land, in association with its size, made it a binding resource in agriculture. A farmer with more hectares of land is better off in loan repayment performance. As witnessed by the survey results, the mean land size of defaulters and non-defaulters was found to be 1.52 hectares and 1.10 hectares, respectively. Moreover there was a significant difference between the two means at 1 percent level of significance.

Farmers in the study area took part in crop and livestock production activities, and about, 85.7 percent of the total respondents owned livestock, with varied sizes in the holdings. Livestock was kept for various economic and social reasons in the study area. The major economic reasons included the provision or supply of draught power, income generation, food, and animal dung (as an organic fertilizer and fuel). Based on Storck *et al.* (1991) standard conversion factors, the livestock population number was converted into Tropical Livestock Unit (TLU), to facilitate

comparison between the two groups. On the average, a household had 2.52 TLU with standard deviation of 2.34 (Table 6). The minimum unit of livestock kept was 0.026 TLU whereas the maximum was 12.31 TLU. Non-defaulters owned a larger number of livestock (on average 3.10 TLU) compared to the defaulters (on average 2.10 TLU) with mean difference significant at 1 percent significant level.

Livestock production, crop production and off-farm activities were important income sources for the sampled borrowers. The average revenue earned by a borrower, from these activities, during the production period 2008/2009 was 11601.98 Birr. Non-defaulters reaped more cash from crops, livestock and off farm activities (11843.83 Birr) than defaulters (9596.35 Birr). The difference between the mean of the two groups was significant at less than 1percent probability level.

The distance in minutes that the beneficiaries traveled on foot to get to a credit source was assessed. Farmers living near lending institution have a location advantage and can contact the lender more easily and frequently than those who live in more distant locations. In line with this, the average time required to reach lending institutions were 38.83 minutes for non-defaulters and 86.18 minutes for defaulters. The mean difference between the distances covered by non-defaulters and defaulters was statistically significant at less one percent level of probability.

Table 7 presents a summary of the socio-economic and institutional factors (discrete variables) among the defaulter and non-defaulter groups for all respondents.

Table 7 Socio-economic and institutional characteristics among defaulters and non defaulters for all respondents (discrete variables)

Characteristics	Defaulters		Non-Defaulters		χ^2-value	Total	
	No.	Percent	No.	Percent		No.	Percent
Gender							
Meal	56.00	56.00	22.00	55.00		78.00	55.71
Female	44.00	44.00	18.00	45.00	0.01	62.00	44.29
Off farm income							
No	62.00	62.00	10.00	25.00		72.00	51.43
Yes	38.00	38.00	30.00	75.00	15.65	68.00	48.57
Crop and livestock disease							
No	22.00	22.00	36.00	90.00		58.00	41.43
Yes	78.00	78.00	4.00	10.00	54.45	82.00	58.57
Received loan from informal sector							
No	64.00	64.00	26.00	65.00		90.00	64.29
yes	36.00	36.00	14.00	35.00	0.01	50.00	35.71
Members of extension package							
No	17.00	17.00	7.00	17.50		24.00	17.14
Yes	83.00	83.00	33.00	82.50	0.01	116.00	82.86
Any social ceremonies							
No	20.00	20.00	30.00	75.00		50.00	35.71
Yes	80.00	80.00	10.00	25.00	37.64	90.00	64.29
Education Level							
Illiterate	77.00	77.00	20.00	50.00		97.00	69.29
Literate	23.00	23.00	20.00	50.00	9.79	43.00	30.71
Opinion on group liability							
Very good	6	6.00	1	2.50		7	5.00
Good	9	9.00	4	10.00	3.276	13	55.71
Fair	26	26.00	16	40.00		42	9.28
Bad	59	59.00	19	47.50		78	30.00

Source: Computed from the survey data

The results revealed that off farm income, crop and livestock disease, social ceremonies and education level had a systematic relationship with loan repayment at less than 5 percent level of probability, while, other variable such as gender, informal credit and membership of extension packages did not have a significant relationship with the defaulter and non defaulter groups.

Education is thought to be a very important determining factor in loan repayment. An educated farmer is able to use modern agricultural technologies, perform farming activities based on a cropping calendar, and manage their resources properly. All these factors boost production, which improves loan repayment. The results indicate that, 30.71 percent of the sampled household heads were is literate, with about 50 percent being from the non-defaulter category, and 23 percent from the defaulter group. The average grade attained for non-defaulter and defaulter household heads were 3.15 and 0.89 grades respectively. Thus, there is a significant difference between non-defaulter and defaulter households with regard to education level at less than one percent level of probability.

Expenditure on social festivals such as weddings, circumcision, funeral of a family member or close relative and engagement was also described. The analysis indicated that of the total respondents, 64.29 percent reported that they had celebrated one or more of the occasional ceremonies ,while 35.71 percent stated that they did not celebrate any ceremonies them during 2008. Meanwhile, 25 percent of non-defaulters and 80 percent of defaulters reported that they had celebrated one or more of these ceremonies. The minimum and maximum expenditures for such ceremonies were Birr 100 and Birr 14000, respectively. Chi square tests indicated that there is a significant association between loan repayment and social festival at less than one percent level of significance.

Of the total respondents, 58.57 percent reported crop failure and livestock disease incidences in the 2008/2009 production year. Meanwhile, 10 percent of non-defaulters and 78 percent of defaulters reported that they had experienced crop and livestock losses because of bad environment, diseases, insects and other pests. This indicates that crop failure and livestock disease affect loan repayment negatively because they affect the total income generated from

agriculture. The minimum and maximum loss for such crop failure and animal diseases were Birr 150 and Birr 20000, respectively. The Chi-square test indicated a systematic association between loan repayment and crop and livestock disease at less than 1 percent level of probability.

About 48.57 percent of the sampled household heads reported that at least one of their family members was engaged in off-farm activities, which helped them to earn additional income. The survey results also indicated that a larger proportion of the non-defaulter households (75.00 percent) engaged in off-farm activities as compared to the defaulter households (38.00 percent). The Chi-square test indicated a systematic association between loan repayment and off-farm activity at one percent level of significance.

The survey results also revealed that majority of the defaulters (59 percent) and non-defaulters (47.50 percent) were dissatisfied with group formation procedures and group liability. The reasons mentioned by the respondents, is that group formation is not based on self selection . that there is low communication among group members, low responsibility for loan repayment, low confidence and low trust among members. These problems might have a negative effect on the loan repayment performance.

4.1.2. Socio-economic and Institutional Characteristics among Defaulters and Non Defaulters in Babile District

Table 8 presents the socio-economic and institutional characteristics inherent among defaulters and non defaulters in Babile district. The hypothesis that socio-economic and institutional characteristics between defaulters and non defaulters are similar was rejected in only some cases, when t calculated greater than t critical as presented in Table 8.

Table 8 Socio-economic and institutional characteristics among defaulters and non defaulters in Babile district (continuous variables)

	Defaulter		Non defaulter					Total sample	
Characteristics	**N=52**		**N=18**		**t. value**	**p. value**	**Test decision**	**N=70**	
	Mean	**sta. dev**	**Mean**	**sta.dev**				**Mean**	**sta. dev**
Age	36.65	9.79	38.17	14.30	-0.50	0.62	Fail to reject	37.04	11.03
Experience Credit	2.77	1.78	5.56	2.01	-5.54	0.00	Reject	3.49	2.20
Family size	5.96	2.01	5.94	2.65	0.03	0.98	Fail to reject	5.96	2.17
Ceremony expense	558.08	611.99	1155.56	3221.84	-1.29	0.20	Fail to reject	711.71	1703.95
Distance from credit	93.46	47.27	38.33	29.26	4.64	0.00	Reject	79.29	49.51
Contact with development agent	1.94	1.23	3.83	1.38	-5.45	0.00	Reject	2.43	1.51
Amount received	1759.62	587.87	1694.44	755.74	0.38	0.71	Fail to reject	1742.86	630.06
Tropical livestock	2.03	2.09	5.48	3.55	-4.97	0.00	Reject	2.92	2.94
Total income	9110.19	6625.58	22415.56	10779.34	-6.18	0.00	Reject	12531.57	9766.32
Total land size	1.23	0.45	2.44	1.89	-4.37	0.00	Reject	1.54	1.14

Source. Computed from the survey data

The results indicate that on one hand there was a significant mean different between defaulter and non defaulters with respect to: experience in credit use, distance from credit source, contact with development agent, total annual income, total land size and tropical livestock unit. On the other hand, age family size, social ceremony expenditure and amount of loan received were not significantly different between defaulters and non-defaulters.

The results of the survey indicate that the average land size for non defaulters was 2.44 hectares and 1.23 hectares, for defaulters. On average, 1.94 and 3.83 of defaulters and non defaulters, respectively, had contact with extension agents each month. This implies that non defaulters had larger land size and more contact with extension agents, compared to the defaulter. The t-test indicated that there was significant different among the two categories at less than one percent level of probability.

Experience of credit use among non defaulters was significantly higher than that of defaulters. On average, non defaulters had 5.56 years experience of credit use, in 2008/2009, while defaulters had only 2.77 years, The t-test indicated that there was significant different among the two categories at less than one percent level of probability.

As indicated in Table 8, the distance from a credit source is negatively correlated with the loan repayment rate, this survey result is in full agreement with the hypothesis. The mean distance was significantly different at less than one percent probability level among defaulters and non defaulters.

On average, non defaulters had relatively large units of livestock. The average livestock units were found to be 3.55 and 2.03 TLU for non defaulters and defaulters respectively. There is a significant difference between these two means at 1percent level of significance. Average annual income of the defaulters and non defaulters was 9110.19 birr, and 22415.56 birr respectively.

The group statistics also indicated that there is a significant difference in the average annual income of the household between the defaulters and non defaulter's household groups at less than one percent level of probability.

Table 9 presents a summary of the socio-economic and institutional factors (discrete variables) among defaulters and non defaulters in Babile district.

Table 9 Socio-economic and institutional characteristics among defaulters and non defaulters in Babile district (discrete variables)

Characteristics	Defaulters		Non-Defaulters		χ^2-value	Total	
	No.	Percent	No.	Percent		No.	Percent
Gender					0.012		
Meal	31	59.62	11	61.11		42	60.00
Female	21	40.38	7	38.89		28	40.00
Off farm income					8.532		
No	35	67.31	5	27.78		40	57.14
Yes	17	32.69	13	72.22		30	42.86
crop and livestock disease					25.656		
No	16	30.77	18	100.00		34	48.57
Yes	36	69.23	0	0.00		36	51.43
Received loan from informal sector					0.698		
No	35	67.31	14	77.78		49	70.00
yes	17	32.69	4	22.22		21	30.00
Members of extension package					2.715		
No	12	23.08	1	5.56		13	18.57
Yes	40	76.92	17	94.44		57	81.43
Any social ceremonies					14.409		
No	14	26.92	14	77.78		28	40.00
Yes	38	73.08	4	22.22		42	60.00
Education Level					6.807		
Illiterate	38	73.08	7	38.89		45	64.29
Literate	14	26.92	11	61.11		25	35.71

Source. Computed from the survey data

The result revealed that off farm income, crop and live stock diseases, social ceremonies and education level had a significant systematic relationship with loan repayment at less than 5 percent level of probability. However, other variable such as gender, informal credit and membership of extension package did not have a significant systematic relationship between defaulters and non defaulters.

The result of the survey indicated that 26.92 percent of farmers in the defaulter group and 61.11 percent of sample farmers in the non defaulter category were literate. Whereas, around 73.08 and 38.89 percent of the sample farmers in the defaulter and non defaulter category respectively was illiterate, the Chi-square test indicated that the systematic association between loan repayment and education level of household head was significant at less than one percent level of probability.

Most of the non-defaulters had off farm income while 67.31 percent of the defaulters did not have another source of income apart from farming. This reveals a positive relationship between off-farm income and loan repayment; indeed, the Chi-square test also indicated that the systematic relationship between loan repayment and off-farm income of household was significant at less than one percent level of probability.

The Chi-square test indicated that the systematic relationship between loan repayment and members of extension package was significant at less than one percent level of probability, that is, 76.92 and 94.44 percent of defaulters and non defaulters were members of extension packages.

Sixty-nine and zero percent of the defaulters and non-defaulters respectively, had livestock and crop loss in 2008/2009 production years because of different reason such as bad weather and different animal and crop diseases. Of the total respondents in this district, 73.08 percent

reported that they had celebrated one, or more, occasional ceremonies and, 22.22 percent stated that they had not celebrated any ceremony, during the study period. Meanwhile, 25 percent of non-defaulters and 80 percent of defaulters reported that they had celebrated one or more of these ceremonies. This implies that the farmers spent a lot of money for unproductive purpose and this affected loan repayment negatively. The chi-square test also indicates that the above two factors have systematic relationship with loan repayment at less than one percent level of probability.

4.1.3. Socio-economic and Institutional Characteristics among Defaulters and Non Defaulters in Combolcha District

Table 10 presents a summary of the socio-economic and institution characteristics (continuous variable) among defaulters and non defaulters in Combolcha district. The hypothesis that socio-economic and institutional characteristics between defaulters and non defaulters is rejected in only some cases, when t calculated greater than t critical, as presented in Table 10.

Characteristics	Defaulter		Non defaulter		t- value	p- value	Test decision	Total sample	
	N=48		N=22					N=70	
	Mean	sta. dev	Mean	sta.dev				Mean	sta. dev
Age	36.98	6.77	33.00	6.20	1.56	0.5[illegible]	Fail to reject	34.34	6.62
Experience Credit	3.35	1.08	2.82	1.20	[illegible]	[illegible]	Fail to reject	3.19	1.57
Family size	6.13	1.88	5.27	1.58	[illegible]	[illegible]	Fail to reject	5.86	1.82
Ceremony expense	1230.42	2573.53	206.82	392.88	[illegible]	[illegible]	Fail to reject	908.72	2188.33
Distance from credit	78.29	38.31	39.23	28.17	[illegible]	[illegible]	Reject	66.03	39.86
Contact with development agent	0.06	0.24	0.91	1.40	[illegible]	[illegible]	Reject	0.33	0.99
Amount received	1756.25	1152.40	1072.73	880.37	[illegible]	[illegible]	Fail to reject	1498.37	1071.43
Tropical livestock	2.18	2.00	2.00	1.80	[illegible]	[illegible]	Fail to reject	2.12	1.86
Total income	10125.02	4836.05	11871.00	10078.68	[illegible]	[illegible]	Fail to reject	10672.59	8193.83
Total land size	0.96	0.36	0.98	0.63	[illegible]	[illegible]	Fail to reject	0.96	0.45

Source: Computed from the survey data

The results indicate on one hand, that, there is a significant mean difference only between distance from credit source and contact with development agents, between defaulters and non-defaulters. On the other hand, education, experience credit use age family size, social ceremony expenditure total annual income, tropical livestock unit and amount of loan received were not significantly different between defaulters and non defaulters.

The survey results indicate that the average time required to reach lending institutions were 39.23 minutes for non-defaulter and 78.29 minutes for defaulters. The mean difference between the distances covered by non-defaulters and defaulters was statistically significant at less than one percent level of probability.

Six and 27.27 percent of the defaulters and non defaulters, respectively, had contact with extension agents. That means that on average, a defaulter was contacted over 0.06 days per month, while, a non defaulter was contacted over 0.91 days. The difference in significance is at 1 percent.

Table 11 presents a summary of the socio-economic and institutional factors (discrete variables) among defaulters and non-defaulters.

Table 11 Socio-economic and institutional characteristics among defaulter and non defaulter in Combolcha district (discrete variables)

Characteristics	Defaulters		Non-Defaulters		χ^2-value	Total	
	No.	Percent	No.	Percent		No.	Percent
Gender							
Meal	25.00	52.08	11.00	50.00		36.00	51.43
Female	23.00	47.92	11.00	50.00	0.03	34.00	48.57
Off farm income							
No	27.00	56.25	5.00	22.73		32.00	45.71
Yes	21.00	43.75	17.00	77.27	6.83	38.00	54.29
Crop and livestock disease							
No	6.00	12.50	18.00	81.82		24.00	34.29
Yes	42.00	87.50	4.00	18.18	32.17	46.00	65.71
Received loan from informal sector							
No	29.00	60.42	12.00	54.55		41.00	58.57
yes	19.00	39.58	10.00	45.45	0.21	29.00	41.43
Members of extension package							
No	5.00	10.42	6.00	27.27		11.00	15.71
Yes	43.00	89.58	16.00	72.73	3.24	59.00	84.29
Any social ceremonies							
No	6.00	12.50	16.00	72.73		22.00	31.43
Yes	42.00	87.50	6.00	27.27	25.39	48.00	68.57
Education Level							
Illiterate	39.00	81.25	13.00	59.09		52.00	74.29
Literate	9.00	18.75	9.00	40.91	3.88	18.00	25.71

Source. Computed from the survey data

The results reveal that off-farm income, crop and livestock disease and social ceremonies had systematic relationship with loan repayment at less than 5 percent level of significance. However, other variable such as gender, education level, informal credit and membership of extension package did not have a significant systematic relationship with defaulters and non-defaulters.

Of the total respondents in this district, 68.57 percent reported that they had celebrated one or more of the occasional ceremonies, while 31.43 percent stated that they had not celebrated any ceremony during the study period. Meanwhile, 27.27 percent of the non-defaulters and 87.50 percent of the defaulters reported that they had celebrated one or more of the ceremonies. On average, defaulters and non-defaulters expenditure for such ceremonies were Birr 1230.42 and Birr 206.82, respectively. The Chi square test indicates that there was a systematic relationship between loan repayment and social ceremonies at less than one percent level of probability.

About 43.75 percent and 77.27 percent of the defaulters and non-defaulter households respectively, participated in off-farm activity. The chi- square test also indicates that off-farm activity had a systematic relationship with loan repayment at less than one percent level of probability.

The Chi-square test indicated that the systematic relationship between loan repayment and household loss due to crop failure and livestock disease was significant at less than one percent level of probability, that is, 42.00 and 18.18 percent of defaulters and non defaulters had crop and livestock loss due to different reasons.

4.2. Determinants of Loan Repayment Performance in East Hararghe

Table 12 presents the result of the analysis of determinants of loan repayment performance in East Hararghe zone.

Table 12 Two-limit Tobit Model estimates and marginal effect of factors influence rate repayment and probability of being Non-defaulter for all the respondents

Variable	Coef.	Std. Err.	t	P>t	Test Decision	Probability Being Non Defaulters	Conditional on Being Uncensored	Unconditional Expected Value
AGRO-ECO	0.1633	0.0626	2.6100	0.0100	Reject	0.2273	0.0924	0.1269
AGE	-0.0024	0.0030	-0.7900	0.4310	Fail to reject	0.0033	0.0013	0.0019
GENDER	0.0507	0.0431	1.1800	0.2420	Fail to reject	0.0704	0.0289	0.0399
EXPCREDIT	0.0249	0.0136	1.8200	0.0700	Fail to reject	0.0350	0.0141	0.0195
FAMSIZE	-0.0127	0.0136	-0.9300	0.3520	Fail to reject	0.0179	0.0072	0.0100
OFF-FARM	0.0982	0.0468	2.1000	0.0380	Reject	0.1382	0.0553	0.0765
PROLOSS	-0.2388	0.0513	-4.6500	0.0000	Reject	0.3504	0.1289	0.1771
INFOCRED	-0.0919	0.0428	-2.1500	0.0340	Reject	0.1225	0.0536	0.0734
MEMEXTE	-0.0233	0.0573	-0.4100	0.6850	Fail to reject	0.0336	0.0129	0.0180
DISCRESOU	-0.0001	0.0002	-0.5300	0.5980	Fail to reject	0.0002	0.0001	0.0001
SOCCEREM	-0.1412	0.0570	-2.4800	0.0150	Reject	0.2110	0.0760	0.1058
NUMTEASS	0.0587	0.0258	2.2700	0.0250	Reject	0.0825	0.0332	0.0459
TLU	-0.0036	0.0145	-0.2500	0.8060	Fail to reject	0.0050	0.0020	0.0028
LOANINCO	-0.4222	0.1538	-2.7400	0.0070	Reject	0.5936	0.2386	0.3305
LANSIZ	0.0808	0.0638	1.2700	0.2080	Fail to reject	0.1136	0.0456	0.0632
EDU	-0.0132	0.0543	-0.2400	0.8080	Fail to reject	0.0184	0.0075	0.0104
_cons	0.9730	0.1563	6.2200	0.0000				
Number of obs					140			
LR chi2(16)					150.31			
Prob > chi2					0.0000			
Pseudo R^2					0.8437			
Log likelihood					-13.9264			

Source. Computed from the survey data

The two limit Tobit result reveals that a total of 16 explanatory variables were considered in the econometric model out of which, 7 variables were found to significantly influence the probability of being non-defaulter and the intensity of loan recovery among the farm households of the entire sample. The log likelihood estimates of the Tobit regression model indicate that agro ecological zone (AGRO-ECO), off-farm activity (OFFFARM), production loss (PROLOSS), informal credit (INFOCRED), celebration of social ceremonies (SOCCEREM), number of contact days of the farm household head with extension agents (NUMTEASS) and loan income ratio (LOANINCO) were important factors, influencing the loan repayment performance of small holder farmers in the study area.

Agro ecological difference (AGRO-ECO) was one of the factors, which significantly influenced the loan repayment performance of the farmers. In this case, study area agro ecological zone was categorized according to lowlands (Babile) and highlands (Combolcha). The econometric model result revealed that residing in an adequate rainfall agro-ecological area increased the probability of being a non-defaulter by 22.73 percent and increased the rate of repayment on average by 12.69 percent for the entire sample of respondents. The reason behind this is that, farmers in good rainfall areas have the opportunity of growing different crops that would help them derive a good income from these activities and diversify their income earning portfolio, thereby enabling them to pay the loans they borrowed, more than farmers living in moisture deficit areas.

Getting income from off-farm activities (OFF-FARM) is another economic factor that positively and significantly affected the loan repayment performance of smallholder farmers. This might be due to the fact that, off-farm activities were additional sources of income for smallholders and the cash generated from these activities could back up the farmers' income to settle their debt even during bad harvest seasons and when the repayment period coincided with low agricultural

prices. Farmers' participation in off-farm activity increases the probability of being non-defaulter by 13.82 percent and on average, increases the rate of loan repayment by 7.65 percent for all respondents. This result supports the hypothesis and complies with the results obtained in the descriptive analysis. Similar results were also obtained by Chirwa (1997) and Bekele (2001) in their studies on agricultural credit repayment in Malawi and Ethiopia, respectively.

The results of the Tobit model reveal that celebration of social ceremonies affected the loan repayment performance negatively. The variable is significant at 5 percent probability level. The possible explanation is that, celebration of one or more of such social ceremonies require more material and financial resources, beyond what the borrowers could afford. This means that the money which should have been used for repayment might have been used for the celebrations. For a discrete change in dummy variable from 0 to 1, the loan recovery rate declines by 10.58 percent for all the respondents. In addition, the probability of a borrower also being a defaulter increases by 20.10 for all the respondents. Belay (1998) has also reported the negative effect of this variable on loan repayment.

The number of contact days that the household head has with extension agents (NUMTEASS) is another important institutional factor, which was positively related to the dependent variable (significant at 5 percent level) for all the respondents. Each additional contact increases the probability of being a non-defaulter by 8.25 percent. Each additional extension contact days increases the rate of repayment by 4.59 percent for the entire sample. This implies that, farmers with more access to technical assistance on agricultural activities were able to repay their loan as promised, more than those who had less or no assistance at all. The reason for this is that, farmers who have frequent contact with development agents are better informed about markets and production technologies. As a result, they are motivated to repay their loans on time,

compared to those with less or no contact with extension agents. Similar result was also obtained by Chirwa (1997), Belay (2002). Roslon and Karin (2009).

The results of the Tobit model reveal that informal loans affected the loan repayment performance negatively at less than 5 percent level of probability. A farmer who borrowed from informal sources (INFOCRED) has a bearing on credit repayment to formal institutions since such farmers prefer to settle loans from nearby lenders and relatives rather than those from distant and non-traditional financial institutions. Therefore, informal borrowers would tend to be defaulters of formal institution in comparison to those who do not borrow from informal services. The marginal effect of the total sample indicates that if a borrower received a loan from informal sources, the probability that they will default increases by 12.25 percent, and the loan recovery rate decreases by 7.34 percent for all the sample observations.

Other factors affecting loan repayment performance negatively were production loss due to bad weather, disease, and pests. Agriculture is widely considered as more risky than other business activities. Thus, it is not surprising that agricultural lending projects have had poor repayment performance. Weather, pests, diseases and other calamities affect crops and animal products, sometimes substantially in extreme cases. In Combolcha and Babile districts specifically, frost, crop disease and pest are serious causes of production loss. Thus, the farmers who had lost their produce, due to the above reasons were less likely to repay their loans, compared to other farmers. For a discrete change in a dummy variable from 0 to 1, the loan recovery rate declines by 17.71 for the entire sample, In addition, the probability of a borrower being a non defaulter also decreases by 35.04 for all respondents. Bekele (2001) has also reported the negative effect of this variable on loan repayment.

The coefficient of loan income ratio was hypothesized to influence loan repayment performance negatively. The results of the Tobit model also indicate that borrowers who had a high loan income ratio had a poorer loan repayment performance. The possible explanation is that borrowers, who had a higher ratio, received a high loan relative to their economic status, without considering the annual income and production. Indirectly, this result reveals that the farmers who had higher annual income from agriculture and off- farm activity were more likely to repay their loan on time. For a unit increase in loan income ratio, loan recovery rate declines by 33.05 percent while the probability of non default decreases by 59.36 percent for all the respondents.

CHAPTURE FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summary, conclusions and policy implications of the present study.

5.1. Summary

Ethiopia is an agricultural country and has employed more than 83.8 percent of the total population in the agricultural sector. Small farmers are numerically dominant, contributing over 95 percent of the annual production. Yet, this output cannot meet the food requirements of the country's population, let alone serve the needs of farmers. There exists a variety of reasons for this problem; one of the reasons why rural households continue to exist in a vicious cycle of poverty, for long periods is their lack of access to financial services. Limited access to financial service is also aggravated by a poor loan repayment performance record. The increasing default rate is one of the major problems facing lending institutions in the study area. Thus, the main objective this study was to analyze which, how and how much the hypothesized explanatory variables were related to the loan repayment performance of smallholder farmers.

The study was carried out in Babile and Combolcha district of East Hararghe Administrative Zone during 2011. Multi stage sampling techniques were employed in the selection of a total of 140 sample borrowers from both districts. Descriptive statistics and the two-limit Tobit model were used to analyze the data collected from the sample respondents.

The descriptive statistics results indicated that about 71.43 percent of the sampled households defaulted on the loans that they obtained. Of these, about 9 percent were complete defaulters and the remaining 91 percent, repaid a certain amount of the proportion of the loan they had received. In addition, the descriptive statistics results revealed that there were significant differences between defaulters and non-defaulters in Babile district with respect to experience in credit use, distance from credit source, total annual income, total land size, TLU, off farm activity,

production loss and social ceremony. In Combolcha district, statistically significant differences were also observed between defaulters and non-defaulters, with respect to the education level, distance from credit source, and frequency of contact with extension agents, off farm activity, production loss and social ceremony.

The two limit Tobit model results indicate that among 16 explanatory variables, which it was hypothesized, influence the loan repayment performance, seven variables were statistically significant for all the respondent population at less than 5 percent level of probability.

Agro ecological zone, off-farm activity, frequency of contact with extension agents positively and significantly influenced loan repayments while, production loss, informal credit, social ceremonies, and loan income ratio negatively influenced the loan repayment performance of small holder farmers in the study area.

5.2. Conclusions and Policy Recommendations

Based on the findings of the study and observation of the environment, in which the current loan delivery and recovery systems are based, the following recommendations are forwarded.

- The number of contact days of the farm household head with development agents is an important institutional factor, which was positively related to loan repayment. Development agents are a strong bridge between the smallholder farmers, and the ministries and other development oriented organizations that render public service. Integrated and participatory rural development strategies can achieve their target if these development agents create strong social and cultural links with the people that they are expected to assist. Therefore, organizing regular in-service and on-job training, providing adequate incentives and remuneration as well as employing

adequate number of development agents will be necessary conditions to change the farmers' attitude toward agricultural transformation, and timely settlement of debt.

- The results of the Tobit model revealed that the celebration of social ceremonies affected loan repayment performance negatively. The customarily celebrated social ceremonies need a great deal of investment beyond what farmers can afford and are found to be one of the major causes of delinquency in the payment of formal loans. Therefore, concrete effort should be made by elders, community leaders, local associations and religious organizations so as to minimize these traditional ceremonies and mitigate the associated expenditure through time.

- The econometric results also indicated that farmers who engaged in off-farm activities earned more income and were able to settle their debts in a more timely manner, than those who were not engaged in off farm activities. This indicates that, rural development strategies should not only emphasize on increasing agricultural production but simultaneous attention should be given to promoting off-farm activities in the rural areas.

- The survey results also revealed that majority of the respondents were dissatisfied with group formation procedures and group liability. Therefore, formation of credit groups through self-selection will help individual members to screen each other effectively. Screening of potential borrowers by initially selecting those of their neighbors, friends and relatives whom they believe to be capable of repaying the loans will help to minimize defaulting problems that emanate from the errors made during initial group formation. Placing the responsibility of group formation on the people would enhance

group advantage on information symmetry that is not available in the emerging microfinance set ups which fix members to groups.

- Lastly, farmers who were residents of adequate rainfall agro-climatic area had better loan repayment performance than farmers who were residents of moisture deficit areas (lowland). The agro-ecology of the area highly influenced agricultural production and productivity of the farmers. Moisture availability is one of the factors that affect the type and range of crops to be grown and livestock to be kept. Therefore, policies and strategies geared towards the development and promotion of new technologies suitable to moisture deficit areas should be given adequate emphasis in order to improve the loan repayment capacity of smallholder farmers living in those moisture deficient zones.

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APPENDICES

Appendix 1 Conversion factors used to Estimate Tropical Livestock Units (TLU)

Livestock type	TLU (Tropical Livestock Unit)
Calf	0.20
Heifer	0.75
Cows/oxen	1.00
Horse/Mule	1.10
Donkey	0.70
Donkey (Young)	0.35
Sheep/Goat	0.13
Sheep/Goat (Young)	0.06
Camel	1.25
Chicken	0.013

Source: Storck *et al*., (1991)

Appendix 2 Microfinance Institutions Operating in Ethiopia as of June 2009 (In Thousands of Birr)

No.	Micro-Financing Institutions	Regions	*Total Capital*	*Saving**	*Credit*	*Total Assets*
1	Amhara credit and savings ins.	Amhara	529,609.0	886,405.0	1,619,420.0	2,227,801.0
2	Dedebit credit and savings ins.	Tigray	404,346.5	467,987.5	1,326,580.2	1,984,013.1
3	Oromiya credit and savings ins.	Oromiya	212,633.9	362,274.9	707,822.5	875,417.1
4	Omo credit and savings ins.	SNNP	62,856.2	163,493.8	459,997.5	525,034.9
5	Specialized fina. & prom. ins.	A.A	22,789.5	15,822.2	37,499.3	49,090.1
6	Gasha micro-financing ins.	A.A	5,345.6	5,594.5	15,916.6	21,646.8
7	Wisdom micro-financing ins.	A.A	48,457.3	23,572.2	94,920.3	107,512.9
8	Sidama micro-financing ins.	SNNP	11,136.8	6,902.4	24,837.2	31,370.6
9	African village financial serv.	A.A	10,828.6	4,095.7	11,364.2	17,598.7
10	Buussa Gonof.micro-financing ins.	Oromiya	22,314.5	8,171.6	42,472.4	53,202.9
11	PEACE micro-financing ins.	A.A	16,115.6	11,044.5	42,511.8	49,143.4
12	Meket micro-financing ins	Amhara	2,509.1	293.2	2,741.3	3,440.5
13	Addis credit &savings ins.	A.A	274,425.0	76,586.0	325,394.0	393,276.0
14	Meklit micro-financing ins.	A.A	5,891.5	7,665.3	20,623.7	22,207.9
15	Eshet micro-financing ins.	Oromiya	11,485.4	5,192.9	35,668.8	44,681.0
16	Wassassa micro-financing ins.	Oromiya	22,753.1	16,659.2	59,390.5	66,009.7
17	Ben. Gum. micro-financing ins.	Ben.Gum	20,423.7	15,951.9	41,056.0	49,292.2
18	Sha.Idi.ye.Ag. micro-financing ins.	Oromiya	3,626.0	1,422.1	8,803.2	10,223.2
19	Metemamen micro-financing ins.	A.A	10,726.4	2,702.7	11,349.8	13,816.0
20	Dire micro-financing ins.	DireDawa	17,727.0	5,984.7	21,510.1	33,650.1
21	Agar micro-financing ins.	A.A	3,510.7	3,949.9	8,543.7	10,177.4
22	Harbu Micro-financing ins.	Oromiya	5,370.5	4,290.0	8,865.3	12,981.5
23	Ghion MFI	Amhara	133.6	52.2	143.2	215.0
24	Leta MFI	Oromiya	1,787.5	280.6	1,218.3	2,087.3
25	Digaf MFI	A.A	612.5	691.4	1,254.2	1,395.0
26	Harar MFI	Harar	9,516.5	1,583.3	5,890.1	14,756.9
27	Lefayda credit & saving ins'n	A.A	470.7	72.4	341.0	589.6
	Total		**1,737,402.7**	**2,098,742.1**	**4,936,135.2**	**6,620,630.8**

Source: NBE (2010)

Appendix 3 Survey Questionnaire

Questionnaire for farm household on "FACTORS AFFECTING LOAN REPAYMENT PERFORMANCE OF SMALLHOLDER FARMERS IN EASTERN HARERGE, ETHIOPIA" for MSC. Research project

General Information

Date : _____

Questionnaire code No. : _____

Name of the enumerator : _____

Ecological zones : _____

Peasant Association : _____

Village : _____

Group Name loaness : _____

A. Individual Background

1. Borrowers name _____. age _____. sex _____religion_____ .
2. Are you married? A) yes B) no
3. Are you participated in formal education? A) yes B) no
4. If yes, what is your level of education? _____
5. Experience in formal credit _____ years and informal credit _____y ears
6. Your family size _____ in number.
7. List the number of your family in the following table

No	Name	sex	Age	Educational level	Relation ship	Marital status	Occupation

8. In which of the following organizations were you participated in the PA?

Farm/social organization	Response (yes or no)	Years served/number
Peasant Association		
'Iddir'		
'Iqqub '		
Others (specify)		

B. Source of income

1. What is the main source of your income

   A) Agriculture B) petty trading C) selling labor D) handicraft E) other (specify)

2. Amount of income obtained from selling crop products and bi product in 2008/2009

No	Type of crop or crop bi product	Amount in quantity	Unit price	Total income (birr)

3. **Amount of income obtained from live stock and live stock product in 2008/2009**

No	Type of crop or crop bi product	Amount in quantity	Unit price	Total income (birr)

4. Amount of income obtained from off farm in 2008/2009

No	Activities	Total working days	Total income (birr)
1	**Petty trading**		
2	**Handicraft**		
3	**Fire wood and charcoal**		
4	**Other(specify)**		

C. Agriculture

1. What is your main activity for income?

   A) Agriculture B) petty trading C) selling labor D) handicraft E) other (specify)
2. Do you have land for cultivation? A) yes B) no
3. If yes, how many timed do you have? _____timed

   a. Owned_____ timed b. rented in_____ timed c. rented out_____ timed
4. Land allocated for

   A) Cultivated _____timed B) Grazing _____timed

   C) Fallow_____ timed D) forest _____ timed

   E) Other (specify) _____timed
5. The degree of fertility of land?

   A) Very poor B) Poor C) Average D) Good E) Very good
6. Is your land holding adequate to satisfy your family needs? A) yes B) no
7. If no, how can you raise your income?

   A) Agriculture B) petty trading C) selling labor D) handicraft E) other (specify)_____
8. Is there any possibility to get land if you want? A) yes B) no
9. If yes how do you get?

   A) free from government B) buying from individuals C) renting D) other (specify)____
10. Do you feel that your family labor adequate for your farm activity? A) yes B) no
11. Have you used hired labor on farm? A) yes B) no

12. If yes, for what farm activity do you hire labor? A) land preparation B) weeding C) harvesting D) threshing E) other (specify)_____

13. Is there labor shortage during peak production period? A) yes B) no

14. If yes, how did you overcome? A) by mutual work (guza) B) hiring daily laborer C) using family labor D) other (specify)_____

15. Allocation of land for different crops during 2008/2009 crop season

No	Type of crops	Area allocated in timed
1	Creal crops	
2	Pulse	
3	Root crop	
4	Coffee	
5	Chat	
6	Fruit	
	Other (specify)	

16. Livestock holding

No	Type of livestock	Number	Purpose	Price/ unit
1	Oxen			
2	Cow			
3	Bulls			
4	Heifer			
5	Calves			
6	Sheep			
7	Goats			
8	Donkey			
9	Camels			
10	Poultry			
11	Others(specify)			

17. The number of oxen used for draught _____

18. The number of cows used for milking _____

D. List of money spend on different items during year 2008/2009

No	Items	Birr
1		
2		
3		
4		
5		

E credit acquisition mechanism

1. What type of credit did you receive in year 2008/2009?A) formal B) informal C) both
2. What is/are the source of formal source of credit
   A) OCSSCO B) development bank(DBE) C) commercial bank D) NGO'S E) other
3. What is/are the source of informal credit multiple answer is possible
   A) Relative B) shopkeepers C) money lender D) other
4. Why did you borrow from the above mentioned source? A) Easier to get loan B) less security required C) cheapest source of credit D) get terms to suit situation E) other ___
5. Did u use your credit for consumption purpose? A) yes B) no
6. If yes, how much? _____ birr
7. Did u get amount of credit your request? A) yes B) no
8. Did you get credit service in time? A) yes B) no
9. Where do you invest your credit money obtained from OCSSO? A) purchase of farm input B) building C) consumption D) social ceremonies E) others _____
10. Did you credit obtained from OCSSO bring change to your living standard? A) yes B) no
11. Rank the main factors affecting your saving and investing decision(give 1 the most affecting you decision)
    A) Extended family obligation _____
    B) Limited market for production _____
    C) Natural disaster _____
    D) Low price of farm product _____
    E) Other (specify)_____

F. institutional and social factors

1. The distance from extension service (hours) _____
2. Are you a member for any extension package? A) yes B) no
3. Distance from your extension service (hrs)_____
4. Distance from your credit source (hrs) _____
5. How many times was your credit source personnel visited you per year? _____
6. What do you feel about output price and market condition?

   A) Very good B) Good C) Fair D) bad
7. Was credit received adequate and timelines? A) yes B) no
8. Did you receive loan from OCSSO group or individual? A) group B) individual
9. If you received loan in group what is your status in your Credit groups? _____
10. Did you celebrate any social ceremonies in 2008/2009? Like wedding, funeral ceremonies, engagement, circumcision, *Iddir/Iqqub* and others

    A) Yes B) no
11. If yes, how much money you invested on it? _____birr
12. Have you or your family gone to a health center for treatment? A) Yes B) no.
13. If yes, how much did you pay? _____
14. The source of the money you paid _____
15. Distance from water point (hours) _____
16. Distance from grinding mills (hours) _____
17. Distance from market (hours) _____

F. Communication

1. Did you follow agricultural programs on the radio? A) yes B) no
2. If literate, have you access to written materials? A) yes B) no
3. If yes, how often? _____If not, why? _____
4. Did you get technical assistance from technical assistance? A) yes B) no
5. If yes, How often per month? _____
6. Did you get training on credit, saving, interest rate from OCSSO? A) yes B) no
7. If yes, how often per month? _____

G. Credit Provision and Loan Repayment

1. What are the criteria to received loan? _____
2. Did you get credit during 2008/2009? A) yes B) no
3. If yes, who did provide you?

   A) OCSSO B) CBE C) DBE D) NGO's E) others (specify) _____
4. If you get loan from OCSSCO, how much did you get? _____birr
5. How much of loan you repaid with last day of repayment period? _____ and amount you saved? _____birr
6. For what purpose you used the loan (rank in order)

   A) Purchase of input B) housing C) clothing D) school fee E) medical expense F) Other(specify)_____
7. If not repaid on the due date, what actions did OCSSCO take on you?

   _____
8. Who have more responsibility to make decision on the credit taken?

   A) Husband B) wife C) both
9. What is your opinion about group formulation in order to repayment loan?

   A) Very good B) Good C) Fair D) Bad
10. What is your opinion on general procedure of OCSSCO in getting loan and repayment?

    A) Very good B) Good C) Fair D) Bad