

Loan Repayment Practice of Borrowers and Its Determinants: Smallholder Farmers Level Analysis

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Abstract

Loan is the money borrowed and must be paid back with or without interest within the time period and under the terms as agreed upon between borrower and lender. This study aimed to investigate and analyze loan repayment practice of farmers and its determinants in Amigna Gesgar Districts. To achieve the objectives of the study mainly primary data was collected from 211 respondents among 602 target population of smallholder farmers and 3 microfinance institutions officials of the district were included and some extent secondary data was incorporated; in analyzing the collected data descriptive and econometric approach were used. The results of the study shows that about 30.34% and 69.66% sample borrowers were defaulters and non-defaulters respectively. Additionally, the binary logit regression model result reveals, the purpose of the loan, experience the farmers, dependency ratio, and wealth the farmers were the determinants that affect the probability of loan repayment significantly at 5% probability level. Finally, it was strongly recommended that, the smallholder farmers should use the money borrowed only for productive economic activities in order to repay the loan on time and the government and private financial institutions should improve services of credit and saving institutions at the rural area of the study area.

Keywords: Dependency Ratio, Loan Repayment, purpose of loan, Smallholder Farmers

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I. Introduction

The primary objective of microfinance institutions (MFIs) is to provide financial services (credit and saving) to the poor in order to release financial constraints and help alleviate poverty. The provision of loan has increasingly been regarded as an important tool for raising the incomes of urban as well as the rural populations, mainly by mobilizing resources to more productive uses. Financial markets are characterized by asymmetric information. Lenders lack information about characteristics of borrowers. Risk exposure limits the potential for growth of rural households in poor countries. Strategies such as the sale of assets, consumption reduction or switching to low-cost food, borrowing from different local sources, relying on relief food, gifts, charity or remittances are commonly considered ex-post, risk-coping measures, aimed at limiting the impact of negative events when they occur (Vigano and Castellani, 2020). This has led to the search for alternative financial service delivery systems for the poor. As development takes place, one question that arises is the extent to which loan can be offered to the private sector to facilitate their taking advantage of the developing entrepreneurial activities. The formal financial institutions played little role in financing development efforts in the rural areas. This is because they are clustered in urban areas, concentrate on funding large enterprises and are inaccessible to the rural poor especially in terms of distance.

Microfinance institutions are institutions that provide suitable financial and other services using innovative methodologies and systems at low cost to meet the need of low-income sections of the population and act as financial intermediaries in a genuine sense. The microfinance revolution was introduced into the development economics arena slightly more than two decades ago. However, the widespread adoption of the microfinance model did not occur until the early 1990s. Since the mid-1990s, microfinance programs and institutions have become an increasingly important component of strategies to promote micro-enterprise development in developing countries and specifically to reduce poverty (Colin and Murinde, 2006). Microfinance Share Company belongs to a wider group of financial institutions regarded as semi-formal financial institution.

Access to credit can help rural poor economy through increasing the ability of households to meet their financial needs such as the purchase and use of improved agricultural inputs which are not available from the farm. Further, access to rural credit may increase the households' ability to adopt modern agricultural technologies that increase the income of the small farm holders and breaks poverty cycle (Geleta, et al, 2018). From the viewpoint of basic economics, the need for microfinance is somewhat surprising. One of the first lessons in introductory economics is the principle of diminishing marginal returns to capital, which says that enterprises with relatively little capital should be able to earn higher returns on their investments than enterprises with a great deal of capital. Poorer enterprises should thus be able to pay banks higher interest rates than richer enterprises. Money should flow from rich depositors to poor entrepreneurs.

Statement of Problem

Public debt is of recent growth and was unheard of prior to the 18th century. In modern times, however, borrowing by the States has become a normal method of government finance along with other sources such as taxes, fees, etc.

The government may borrow from banks, business houses, other organizations and individuals. Even student's loan at the end of 2018, outstanding U.S. student loan debt exceeded \$1.46 trillion (Federal Reserve Bank of New York, 2019). Over 95% of outstanding student loan debt is held or guaranteed by the federal government (Abraham, 2020). The government loan is generally in the form of bonds (or treasury bills if the loan is required for short periods) which are promises of the government to pay to the holders of these bills the principal sum along with interest at the stated rate.

Borrowing is resorted to in order to provide funds for financing a current deficit. This definition very clearly explains the three features of public debt: first, public debt arises in the form of borrowings by the treasury or by the state exchequer; second, the government borrows a certain amount now but promises to pay in the future not only the principal amount but the interest also. And the third, the government borrows when there is a budget deficit i.e. public expenditure is more than revenue. Repayment rate measures the amount of payment received with respect to the amount due. Portfolio quality ratios; involves the arrears rate portfolio risk and the ratio delinquent borrowers. The arrears ratio rate shows how much of the loans have become due and has not been received. Portfolio rate refers to the outstanding balance of all loans that have an amount due. Delinquent borrowers determine the number of borrowers who are delinquent relative to the volume of delinquent loans.

Recently, financial sustainability of MFIs has been one of the critical elements that captured the attention of many researchers throughout the globe as many countries did aggressively on outreach by opening up various MFIs in different geographical regions they have. Different researchers at different angle from different discipline try to identify the determinants of loan repayment. Based their result, it was suggested that the microfinance institutions and other concerning bodies should work more on increasing rural households' participation in microfinance services to improve the income of participant households in the area (Geleta, et al, 2018). It implies that to remove the absolute poverty of developing countries like Ethiopia microfinance role was great.

In case of Bahir Dar loan diversion and availability of other source of credit have a negative impact on loan repayment. In both cities loan size has negatively related, whereas suitability of repayment period is significantly and positively related, but sex and educational are positively related, Reta (2000, cited in Jemal, 2003) in his study the impact of microfinance on living conditions of fuel wood carriers women in Addis Ababa. Employed probit model and the finding shows supervision, repayment period suitability and other source of income were positive impact on loan repayment performance, while education level were negative impact related to loan repayment. Belay (2002), factors influencing loan repayment of rural women in Eastern Ethiopia: case of Dire Dawa. His findings shows that land size is the basic asset of farmers, the cultivated land size owned by sample households' respondents were the contributing factor for reducing the default rate. In addition to this the non-defaulter respondents traveled on average less distance than defaulter. Hence, the distance has significant and negative impact on loan repayment performance.

The financial sustainability of MFIs is a necessary condition for institutional sustainability and their continuity to service the demands of the poor. Abebe (2013,) study conducted on factors that influence microfinance loan repayment and evaluating the loan rating mechanism: case of Oromia credit and saving Share Company (OCSS) the research employed both primary data collected through structured questionnaire. The result of descriptive statistics and the probit model shows education, income, loan supervision, suitability of repayment period, availability of other credit source and livestock are significant factors that enhance loan repayment performance, while loan diversion and loan size significantly increase loan default. In addition female borrowers were better performance in terms of loan repayment than male. According to Afework (2016), indicated that about 85.3 percent of the sample borrowers were defaulters and only 14.7 percent are non-defaulters. This implies there are challenged in the repayment of loan on time. This both result implies that there are challenged in the repayment of loan on time. Even some researchers output recommends small micro small and medium scale enterprises should have proper credit management policies since it help a firm to enjoy benefits of credit discounts (Abebe, 2019).

In general, the researcher identify the following gaps regarding to importance of conducting the research on determinants of loan repayment at the study area: the first, from the experience of the researcher as who live within the community, many of local rural farmers did not repay the loan on time; the second, the researchers conducted on the title particularly concerns with borrows side smallholder farmers few. The third, what makes my research different from the previous researchers was, mostly the previous researchers were more related to urban area and lenders side while my research mainly focus on the borrowers side, particularly smallholder farmers of the rural area of Amigna Gesgar. Lastly, even though farmers around study area were poor like others parts of Ethiopia, according to the estimation made by experts of the district Agricultural Development Office, the major soil types are vertical (75 %), Luvisol (15%) and cambisols (10%). All types of the soil are naturally fertile and good for agriculture, which implies naturally the area was comfortable for agricultural production. The positive impacts of MFIs on the socio-economic welfare of the poor, however, can only be sustained if the M can achieve good performance in terms of both outreach and financial sustainability. Additionally, despite the expanded the services of microfinance institutions, the awareness of smallholder farmers in its services and loan repayment in Amigna Gesgar District is still poor; this motivates the researcher to investigate on loan repayment practice of smallholder

farmers and its determinants at district. The research the main research questions were:

- What are customer's farmer's capacity in repayment of the loan in Amigna Gesgar District?
- What are the determinants of loan repayment practice of farmers in at the study area?
- How the problem of loan repayment can be reduced?

Significance the study

The study will have numerous importance, among those the following are the potential significances. It was be important to create awareness in borrowing loan from microfinance by smallholder farmers. Second, it identifies the major determinants, depend on the identified farmers will reduce loan repayment on time. Third, microfinance institutions may change their policies, strategies to help poorer smallholder farmers depend on the identified outcomes. Moreover, this study which identified and raised some main points related to the loan repayment practice of farmers and its determinants issues and there by stimulates further investigations.

II. Review of literature

1. Theoretical Literature Review

i. Concepts of Micro Finance Institutions and Credit Policy

According to Wood (1998) cited in Walter (2013), defined micro finance institutions as institutions that provide financial services to low income earners. These financial services may include savings, loans, insurance transfer and payment services to enhance growth of small scale enterprises. According to Graham et al (1990) microfinance, refers to the provision of financial services to the low- income earners who do not earn or obtain their services from the formal financial institutions because of their business saving levels and credit needs are very small. To Bank of definition, microfinance institutions are non-governmental institutions savings and credit co-operatives that provide savings and microloans not exceeding US \$ 5000 for project to poor individual's average not exceeding US \$1000 per project to poor individual enterprises or groups for the purpose of engaging in income generating activities.

A credit policy is an institutional method for analyzing credit requests and its decision criteria for accepting or rejecting applications. Credit policy is important in the management of accounts receivables. A firm has time flexibility of shaping credit policy within the confines of its practices. It is therefore a means of reducing high default risk implying that the firm should be discretionary in granting loans.

Policies save time by ensuring that the same issue is not discussed over and over again each time a decision is to be made. This ensures that decisions are consistent and fair and that people in the same circumstance get treated in the same manner (Khandkar and Khan, 1998). A credit policy provides a frame work for the entire management practices. This provides risk protections by enabling the lending institutions to follow up when the borrowers fail to honor the agreement. Microfinance is a form of financial development that has primarily focused on alleviating poverty through providing financial services to the lower income society or the poor. People think of microfinance, if at all, as being about microcredit, which is lending small amounts of money to the poor. Microfinance is not only offering this service only, but also it provides broader: including insurance, transactional services, and savings (Barr, 2004).

The characteristics of microfinance products include (Murray and Boros, 2002, pp.10-11): small amounts of loans and savings, short- period loans (up to one year term), payment schedules attribute frequent installments or frequent deposits, payments (installments) made up from both principal and interest, higher interest rates on credit (higher than commercial bank rates), easy access to the microfinance intermediary saves the time and money of the client and permits the intermediary to have a better idea about the clients' financial and social status, simple application procedures, short processing periods (between the completion of the application and the disbursement of the loan), the clients who pay on time become eligible for repeat loans with higher amounts. No collateral is required contrary to formal banking practices. instead of collateral, microfinance intermediaries use alternative methods, like, the assessments of clients' repayment potential by running cash flow analyses, which is based on the stream of cash flows, generated by the activities for which loans are taken.

ii. Microfinance in Ethiopia

Microfinance institutions introduced in Ethiopia after the dawn fall of the Derg regime following the policy of economic liberalization. The development of microfinance institutions in Ethiopia is a recent phenomenon. Ethiopian development strategy is the establishment of sustainable microfinance institutions serving large number of poor people. Microfinance is taken as a shift from government and NGO subsidized loan programs to finance services run by specialized financial institutions. Later microcredit programs were changed to microfinance institutions. Non-governmental organization (NGO) credit schemes and informal sources of finance have existed in Ethiopia for many years; the government instituted a legal and policy framework for MFIs in 1996 through Proclamation 40/1996 (Gebrehiwot, 2002).

Currently, the Ethiopian microfinance industry is rapidly growing. Recently, there are 31 MFIs reaching around 2.4 million people (AfDB, 2012). The deposit interest rate is 3-8% and lending interest rate is 12-24% in 2012. Most MFIs are doing remarkably well in terms of financial performance given their relatively short track

record (Facet, 2013). Fikirte (2011) on her study loan repayment performance of Addis credit and saving institution (AdCSI) in Addis Ababa, Ethiopia she employed a binary logit model used to analyze socio economic factors that influence loan repayment. The study shows out of 11 variables age and five business types (baltina & petty market, kiosk & shop, services providing, weaving & tailoring and urban agriculture) were important in influencing loan repayment performance of the borrower. In this study loan provision in group based lending in terms of the dependency ratio was negatively and significantly related to being defaulter, implies that borrower family in the group lending might be involved in productive activities. Furthermore, sex and business experience of the respondents were found to be insignificant and positively related to loan repayment rate. Characteristics of Microfinance gives access of financial services to low-income people, who wish to access money for starting or raising an income generation activity. The individual loans and savings of the poor clients are small. Microfinance came into being from the appreciation that micro-entrepreneurs and some poorer clients cannot have access to borrow from banks, that is, they can repay, both the principal and interest, on time and also make savings, provided financial services are tailored to suit their needs. Microfinance as an institution has created financial products and services that together have enabled low-income people to become clients of a banking intermediary.

2. Empirical literature

The existing theoretical models of peer monitoring deduce that repayment performance in group lending programs is positively related to the homogeneity of members with respect to the riskiness of their projects. In group-lending programs, the functions of screening, monitoring and the enforcement of repayment are to a large extent, transferred from bank to group members. The financial intermediary reduces recurrent lending transaction costs by replacing a multiple of small loans to individuals with a larger group loan (Zellar, 1998). This reduction in transaction costs enables financial intermediaries to bank with poor, who demand small loans and who would not receive any credit under an individual loan contract because of excessive unit transaction costs of tiny loans.

It was argued that probably the most important rationale for group lending is the information and monitoring advantages that group-based financial institutions at the community level have, compared to individual contracts between a bank and borrower. Group members get important information like reputation, indebtedness and asset ownership of the loan applicants at a lower cost (ibid). They can also easily monitor individual efforts made towards ensuring repayment. On the other hand, groups may also have a comparative advantage in enforcement of loan repayment. Moreover, group members appear to be in a better position to assess the reason for default and to offer insurance services to members who are experiencing shock that are beyond their control.

Individuals select those whom they trust to form a group with that is they want those who can make regular repayments, have a good concern about the possible loss they face in case of non-repayment, ultimately leading to the exclusion of the poorest of the poor. According to him presence of high geographical mobility, low attachment to specific neighborhoods and peer groups consisting of competitors are the factors that frustrate the solidarity of groups in urban areas, and hence group lending is more applicable to the rural environment than to urban society.

Million et al., (2012) studied on factors affecting loan repayment performance of Small holder farmer in Eastern Harergie, Ethiopia. In order to analyze the factors that influenced loan repayment performance, employed a two limit tobit regression model and also structural questioner was used to collect information from 140respondent in two district (Kombolcha and Babile),by using multi stage sampling technique. The result shows that agro ecological zone, off farm activities and technical assistance from extension agents positively influence loan repayment performance, while product loss, informal credit, social festival are negatively related to loan repayment.

Abafita (2003) analyzed the microfinance repayment performance of Oromia Credit and Saving Institution in Kuyu, Ethiopia. According to his finding; sex, loan size and number of dependents are negatively related to loan repayment. On the other hand age was found to be positive, while age squared turned to be negative. Income from activities financed by loan, repayment period suitability and loan supervision are positively and significantly related to loan repayment performance. Moreover, loan diversion is significant and negatively related to loan repayment rate. The negative sign implies that the use of diverted funds for non-income generating purposes.

Zeller (1998) analyzed the determinants of repayment performance of credit groups in Madagascar. His finding is groups with higher level of social cohesion have a better repayment rate. Moreover, the programs that provide saving service to their members have a significantly higher repayment rate. Olagunju & Adeyemo (2007) and Oke et.al. (2007) also analyzed the determinants of repayment decision among small holder farmers in southwestern Nigeria. The result showed that the number of visits made by loan officers to the borrowers, higher level of education, and time of loan disbursement would have a better repayment performance.

III. Aim and Objective of Study

The general objective of the study was to assess the loan repayment practice of farmers and its determinants in case of Amigna Gesgar District, Arsi Zone, Oromia National Regional State, Ethiopia. And the specific objective of the study were the followings:

- To assess the capacity of farmers in the repayment of loan at the study area.

- To examine how to reduce the problems of loan repayment performance of rural households
- To identify the factors that affect farmers in loan repayment at the study area.

Hypothesis of the study

Several statements of supposition can be made in view of loan repayment practice of smallholder farmers and its determinants at the study area. The following lists of hypotheses¹ are the major ones on which the study is pivoting. Hypothesis 1: The dependency ratio has no significant impact on loan repayment of smallholder farmers at the study area.

Hypothesis 2: The purpose of money borrowed by a smallholder farmer and loan repayment has no relationship.

Hypothesis 3: Education of smallholder farmers has significant impact on the probability of loan repayment of at the decreases.

Hypothesis 4: Education of smallholder farmers positively affect the probability of loan repayment of at the study area. .

Hypothesis 5: The level of wealth of smallholder farmers has insignificant impact on the probability loan repayment of the smallholder farmers at the study area.

Hypothesis 6: Marital status of smallholder farmers has significant on his/her loan repayment of at the study area.

IV. Research Methodology

1. Description of the Study Area

The study was conducted in the Amigna Gesgar, one of the districts of Arsi zone, located in Oromia Regional State. Amigna is one of the districts of Arsi zone. According to the information obtained from elder persons of the area, the name Amigna was derived from one of the Oromo sub-clans, which is known as Amigna. It was recognized as an administrative district in 1958E.C. The district shares boundary line with West Hararghe Zone in the East, Gololcha and Chole districts in the north, Sude and Robe districts in the west and Belelegesgar, Seru district in the south. Regarding aerial coverage, Amigna district has a total area of 1314 km accounting for about 5.6% of the total area of the Arsi Zone. Adelle town is the capital of the district; it is located at 254km from Addis Ababa/Finfinnee capital city of Ethiopia and 129.71km from zonal capital, Asela. (OBFEC, 2019).

2. Sampling Technique and Sample Size

The researcher used the mix of purposive and simple random probability sampling techniques; first the four sample *gandas*² was selected purposively. As the Central Statistical Agency of Ethiopia (2007), the size of estimated population of Amigna Gesgar was totally 73,245; among this 91.23% (6,820) were rural residents. According to this data, from the total residents of the rural area of district 33, 294 and 33, 523 were males and females, respectively. By considering this data, the researcher estimates the population size of the selected four *gandas* at the period of the data collection and estimates the number of their households head as 602; this was the size of target population which includes both defaulters and non-defaulters, smallholder farmers. Then, sample size was determined by using 95% level of confidence, 9% degree of variability and margin of error (e) (Yemane, 1967 cited in Bahabelom, 2010).

$$n = \frac{N}{1 + N(e^2)}$$
$$n = \frac{602}{1 + 602(0.09)^2} = 211$$

Where, n: sample size, N: population size e: level of accuracy

A total of 211 respondents were taken from the population size of 602 smallholder farmers of the four selected small administration units of the district.

3. Data Source and Method of Data Collection

The researcher has been used both primary and secondary data; mainly primary data source. The data was collected through questionnaire, interview and focus group discussion in order to get more information in detail about the title. The target respondents were 211 smallholder farmers, and 3 officials from the district. And the secondary data was collected from different both published and unpublished documents that concerns with the selected title.

4. Research Design

Research design is a backbone of a paper in specifying the method and procedures for collecting and analyzing the information. The quantitative approach involves the generation of data in quantitative form which can be subjected to rigorous quantitative analysis in a formal and rigid fashion. However, qualitative approach to research is concerned with subjective assessment of attitudes, opinions and behavior (Kothari, 2004). This study is analytical to establish the degree of relationships between some relevant factors and issues as well as to show the relative size or significance of each factor relative to the others. The types of research employed under this study was descriptive and econometrics approach. The major purpose of descriptive research is description of the state of affairs as it exists at present.

¹ All of the listed hypothesis were null hypothesis while the opposite idea of each null hypothesis was alternative hypothesis.

² *ganda* -refers to the lowest level of administration in a given district or town; and *gandas* or *gandoota*- plural form of *ganda*

can estimate the regression equation as follows is not observable and is a latent variable.

Aggregating the value yields.

$$*y = \alpha + \sum_{k=1}^k \beta_k X_k + \varepsilon \dots\dots\dots 2$$

In practice *y is unobserved, and ε is symmetrically distributed with zero mean and has cumulative distribution function (CDF) defined as $F(\varepsilon)$. What we observe is a dummy variable

y, a realization of a binomial process defined by

$$y = \begin{cases} 1, & \text{if } y > 0 \\ 0 & \text{otherwise} \end{cases} \dots\dots\dots 3$$

From equation (1) leaving the constant term and rewriting the model yields

$$\begin{aligned} \text{Prob}(Y=1) &= \text{Prob} \left(\sum_{k=1}^k \beta_k X_k + \varepsilon > 0 \right) \\ &= \text{Prob} \left(\varepsilon > - \sum_{k=1}^k \beta_k X_k \right) \\ &= 1 - F \left(- \sum_{k=1}^k \beta_k X_k \right) \dots\dots\dots 4 \end{aligned}$$

The logit model usually takes two forms. It may be expressed in terms of logit or in terms of event probability. When expressed in logit form, the model is specified as

$$\text{Log} \left[\frac{p(y=1)}{1-p(y=1)} \right] = \sum_{k=1}^k \beta_k X_k \dots\dots\dots 5$$

Using equation '4' and '5' can be transformed into a specification of the logit model of event probability by replacing the general CDF, F, with a specific CDF, L representing the Logistic distribution

$$\begin{aligned} \text{Prob}(y=1) &= 1 - L \left(\sum_{k=1}^k \beta_k X_k \right) = L \left(\sum_{k=1}^k \beta_k X_k \right) \\ &= \frac{e^{\sum_{k=1}^k \beta_k X_k}}{1 + e^{\sum_{k=1}^k \beta_k X_k}} \dots\dots\dots 6 \end{aligned}$$

The above equation was represent the probability of an event occurring. For a non-event, the probability is just 1 minus the event probability.

$$\begin{aligned} \text{Prob}(y=0) &= \left(\sum_{k=1}^k \beta_k X_k \right) = L \left(\sum_{k=1}^k \beta_k X_k \right) \\ &= \frac{e^{-\sum_{k=1}^k \beta_k X_k}}{1 + e^{-\sum_{k=1}^k \beta_k X_k}} \dots\dots\dots 7 \end{aligned}$$

Also since the above equation $z_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \dots + \beta_i x_i + E_i$ from the above model let us substitute z_i with dp (dummy of participation) as the dependent variable.

Where dp = dummy of poverty, E_i is error term, β_0 is constant and β 's are coefficients.

The researcher specify y the model as follow through the relationship between dependent and independent variables.

$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7)$ Where: Y = borrower's loan repayment status, X = independent variables that explained above.

Addition to the above points, to have relevant output particularly in the econometrics model the necessary test of the binary logit regression model which includes correlation test, good fitness of the model test were employed.

V. Data analysis and Interpretations

1. Descriptive Analysis

The collected data was analyzed and interpreted by Table's frequencies and percentages was used to identify the main determinants of loan repayment of the borrowers, smallholder farmers at the study area.

A. Demographic Characteristics of the Respondents.

i. Age and sex of Respondent

As shown in the following table the sex of the respondents who participate in responding, or filling the questionnaire were both males and females. But, in interview and focus group discussion all of them were females.

Table 1: Sex Structure of the Respondents

Sex	Defaulters		Non-Defaulters		Grand total	
	number	In percentage	number	percentage	number	percentage
male	60	28.44%	130	61.61%	190	90%
Female	4	1.9%	17	8.05%	21	10%
Total	64	30.34%	147	69.66%	211	100%

Source: Computed from the Data Collected, 2020

The above Table 1 shows that the respondents includes both males and female, 90% of the respondents were males and the left were females. Among the selected respondents 28.44% were defaulters during the data was collected.

From this result, it can be concluded that the sex of the respondent has insignificant association with the loan repayment at the study area. On the other hand, as explicated in the Table 2 below, from the total selected respondents 30.34%, 69.66% were defaulters and non-defaulters respectively. The result shows the number of both defaulters and non-defaulters of the selected respondents, 54 and 179 found in labor productive age. Even though

from the selected respondents 0.95% of them totally from the age of above 64(from their age group 100%), it can be summarized as the relationship among the age of borrowers (smallholder farmers) and the probability of loan repayment is weak. Also this fact was explained econometrics approach, binary logit regression model (see Table 4 below).

Table 2: Age of the Respondents

Age	Defaulters		Non-Defaulters		Grand total	
	Number	In percentage	number	In percentage	number	percentage
18-30	8	3.7%	22	10.43%	30	14.22%
31-64	54	25.6%	125	59.24%	179	84.8%
>64	2	0.95%	0	0%	2	0.95%
Total	64	30.34%	147	69.66%	211	100%

Source: Computed from the Data Collected, 2020

ii. Marital status of the respondents

Marital status of the respondents was another interest of the researcher in the sense that it explains the extent of one's responsibility, therefore it was investigated and the following Table shows the response.

According to the Table 3, 26% among the defaulters of the respondents which is the biggest percentage were married while 3.3% and 1.9% of the respondents single and divorced respectively. As the collected data indicates that, from the small holder farmers at the study area about 76.7% of them were married while 47 of respondents (22.3 %) were single (unmarried) farmer, borrower. However, as explained in the table among defaulters, most of them 55 (86% from the total number of defaulters) or 26% from the total respondents were married; this data reflects that these households who borrow money in the marital status of married negatively affect the probability of loan repayment at the study area.

Table 3: Marital status of the respondent

Marital status	Defaulters		Non-Defaulters		Grand total	
	number	In percentage	number	In percentage	number	percentage
Married	55	26%	117	50.7%	172	76.7%
Single	7	3.3%	40	19%	47	22.3%
Divorced	4	1.9%	0	0%	2	1.9%
widow	0	0%	0	0%	0	0%
Total	64	30.34%	147	69.66%	211	100%

Source: Computed from the Data Collected, 2020

2. Econometric Analysis of the Determinants of Loan Repayment

An economic model, logistic regression model, binary logistic model was used, by independent variables used in order to identify determinants of loan repayment of smallholder farmers at the study area. Binomial (or binary) logistic regression is a form of regression which is used when the dependent is a dichotomy and the independents are of any type. In this research, the dependent variable, that is. the status of the probability of loan repayment on time fully, which implies it is dichotomy; while the independent variables include both dummy and continuous variables as explained above. Therefore, the best model is binomial (or binary) logistic regression (Gujarati and Porter, 2009).

The result of binary logit regression model with coefficients helps simply to understand the direction of relation between the probability of loan repayment and each independent variable like what happen in OLS, even though their interpretation in magnitude is different and the result was the followings:

Table 4: General Output of Binary logit Regression Model with Coefficients

loan repay~s	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
educ_brwr	-.2305555	.2003151	-1.15	0.250	-.6231658	.1620548
bexpr_brwr*	.8193277	.2274996	3.60	0.000	.3734367	1.265219
age_brwr	.0384413	.0281152	1.37	0.172	-.0166635	.0935462
maritalstu~r	-1.741071	1.746197	-1.00	0.319	-5.163554	1.681413
purpose_loan**	1.935084	.9070208	2.13	0.033	.1573557	3.712812
wlth_brwr*	.0046189	.00155	2.98	0.003	.001581	.0076569
dependency~o*	-2.229744	.4847155	-4.60	0.000	-3.179769	-1.279719
cons	1.290446	2.274012	0.57	0.570	-3.166536	5.747428

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

Source: Computed from the Data Collected, 2020

And the result of the binary logit regression model was estimates as:

$$L = 1.29 - 2.229dr + 0.005w + 1.935p - 1.741m + 0.038a + .819ex + 23ed + \epsilon$$

Where: 1. L-probability of loan repayment (the dependent variable), age, ed-education, m-marital status, p-purpose of loan, ex-experience, de-dependency ratio and w-wealth

Additionally, we can calculate t-statistics to in order to check the significances of each independent variable. For instance, it can be calculated for the purpose of the loan in order to check its significances status in the binary logistic model as below:

$$t^* = \frac{b_1 - \beta_1}{se(b_1)} = \frac{b_1}{se(b_1)} = \frac{-1.935084}{0.9070208} = |-2.13| = \underline{2.13}$$

The value of the t-statistic that corresponds to the 5 % (commonly used) significance level is 1.96 and $2.13 > 1.96$, so we reject the null hypothesis. That means the estimate is significantly different from zero at 5% significant level. The same is true for others independent variables also. As explained in the Table above, seven independent variables are hypothesized to have influence on the probability of loan repayment of borrowers included in the model of which s four of them were found to be statistically significant and the sign of most independent variables were as expected; purpose of the loan, experience the smallholder farmer, dependency ratio of households of smallholder farmer or the borrower and wealth the smallholder farmer.

Interpretation of Odds Ratio in the model

In this study, dependent denoted as the probability of loan repayment bay smallholder farmers that determined by various independent variables. In the other words, odds of the model tell by what factor the dependent variable change does whenever a unit change occurs in an independent variable (Greene, 2012). OR^1 is the Log value of odds and is always positive. In this particular study it is found out that the odds ratio, the ratio of the probability of being participant to the probability of non-non participant. The detail let's interpretation logit model with odd ratio was as the followings:

Table 5: General Output of Binary logit Regression Model with Odd ratios

Logistic regression	Number of obs	=	211
	LR chi2(7)	=	165.08
	Prob > chi2	=	0.0000
Log likelihood = -30.600937	Pseudo R2	=	0.7295

loan_repay~s	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]
educ_brwr	.7940924	.1590687	-1.15	0.250	.5362441 1.175925
bexpr_brwr	2.268974	.5161906	3.60	0.000	1.452719 3.543868
age_brwr	1.03919	.0292171	1.37	0.172	.9834746 1.098061
maritalstu~r	.1753326	.3061653	-1.00	0.319	.0057213 5.373143
purpose_loan	6.924625	6.280779	2.13	0.033	1.170412 40.96885
wlth_brwr	1.00463	.0015572	2.98	0.003	1.001582 1.007686
dependency~o	.107556	.052134	-4.60	0.000	.0415953 .2781154

Source: Computed from the Data Collected, 2020

i. *Age of the smallholder farmer/the borrower (age_brwr)*

In the study, the age of the borrower was measured as continuous variable education level. The result of the study shows that as the age of the borrower increases the ability/ performance to repay the money borrowed on time increases because as the age of the borrower increases his/her income from farm and non-farm economic activities increases. And, as explained in the Table 5 above, even though in the result of the model the age of the borrower (smallholder farmer household head) had insignificant even at 10% probability level, i.e. it had less impact on the dependent variable.

ii. *Educational Level of the smallholder farmer/the borrower (educ_brwr)*

In the designing of the research, the education level of the borrower taken as continuous variable and measured in the number of years the stay in school. In the model of the study, as demonstrated in the Table 5 above, marital status of smallholder farmer/ the borrower was insignificant; that is , it had less impact in determining the performance farmers (as borrowers) in loan repayment on time at the study area (rural).

iii. *Marital Status of the smallholder farmer/the borrower (maritalstu_brwr):* In the model of the study, marital status of smallholder farmer, household head at the study area was insignificant variable at 5% probability level.

iv. *Purpose of the Loan (purpose_loan)*

The model result, at the study area the purpose of the loan was significant at 5% probability level (as explained in the Table 5 above). And the interpretation of the result is as a smallholder farmer (the borrower) increases the money borrowed for investment purpose by one percent (going from 0 to 1), the probability of repayment of loan increases by 6.92 times greater, given that all of the other variables in the model are held constant.

v. *Experience the smallholder farmer/the borrower (bexper_brwr)*

¹ Odds Ratio -The odds ratio is a measure, or it approximates how much more likely (or unlikely); it is for the outcome to be present among those with independent dummy variables is equal to one than among those independent. Odd ratio in favor of participation in economic activities —the ratio of the probability that a woman participate in economic activities to the probability that she will not participate in economic activities (Green. 2012).

As demonstrated in Table 5, the experience the smallholder farmer on utilizing loan on business activities has significant impact on the dependent at 5% probability level. And the interpretation of the result is as the experience on utilizing loan for business investment of smallholder farmer (the borrower) increases by one year, the probability of repayment of loan increases by 2.27 times greater, given that all of the other variables in the model are held constant.

vi. *Dependency ratio of households of smallholder farmer or the borrower (dependency_ratio)*

As presented in the Table 5, the dependency ratio of households of smallholder farmer has significant impact on the dependent variable, the probability of loan repayment successfully at 5% probability level. And the interpretation of the result is as the experience on utilizing loan for business investment of smallholder farmer (the borrower) increases by one year, the probability of repayment of loan increases by 0.108 times less, given that all of the other variables in the model are held constant. On other hand, borrowers with lower number of children household members (lower dependency ratio) would meet their repayment obligation better than those with high number of children household members.

vii. *Wealth the smallholder farmer (wlth_brwr):* As explained in the Table 5, the wealth the smallholder farmer of households of smallholder farmer has significant impact on the dependent variable, the probability of loan repayment successfully at 5% probability level. And the interpretation of the result is as the wealth of smallholder farmer (the borrower) increases by one percent, the probability of repayment of loan increases by 1.01 times greater, given that all of the other variables in the model hold constant.

Table 6: Correlation among continuous independent result

```
. cor educ_brwr bexpr_brwr age_brwr wlth_brwr dependency_ratio
(obs=211)
```

	educ_b~r	bexpr_~r	age_brwr	wlth_b~r	depend~o
educ_brwr	1.0000				
bexpr_brwr	-0.0004	1.0000			
age_brwr	0.0003	0.0850	1.0000		
wlth_brwr	0.1351	0.2727	0.0787	1.0000	
dependency~o	-0.0309	-0.6409	-0.0099	-0.3123	1.0000

Source: Computed from the Data Collected, 2020

To the extent that one independent is a linear function of another independent, the problem of multicollinearity will occur in logistic regression, as it does in ordinary linear regression (Green, 2012). Thus, the correlation among continuous independent variables was also tested as presented in the Table 6 above; and the result shows that, the correlation results demonstrates among continuous variables there was weak correlation, for the most of independent variables the values were less than 0.4, which implies the problem of multi-collinearity didn't occur in the binary logit regression model.

Table 7: Marginal Effects of the Model

```
Marginal effects after logit
y = Pr(loan_repayment_status) (predict)
= .9747009
```

variable	dy/dx	Std. Err.	z	P> z	[95% C.I.]	x
educ_b~r	-.0056853	.00543	-1.05	0.295	-.016328 .004957	3.46445
bexpr_~r	.0202039	.01266	1.60	0.110	-.004601 .045008	3.35071
age_brwr	.0009479	.00076	1.24	0.215	-.00055 .002446	43.0237
marita~r*	-.0283318	.02019	-1.40	0.160	-.067897 .011233	.815166
purpos~n*	.0872884	.07293	1.20	0.231	-.055654 .230231	.772512
wlth_b~r	.0001139	.00006	1.80	0.072	-.00001 .000238	412.607
depend~o	-.0549834	.02969	-1.85	0.064	-.113176 .003209	1.44455

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Source: Computed from the Data Collected, 2020

The marginal effect of the model was computed as explained in Table 7 above. For instance, the result of marginal effects shows, as a smallholder farmer has a one year in business experience (as borrower) has a 2% higher probability of loan repayment.

Addition to the independent variables used in the model above, the as determinants of smallholder farmers, the result of the collected data through interview and focus group discussion demonstrates others factors also affect the probability of loan repayment. Among them, first expectation of the future can influence the savings of smallholder farmer, because if prices of goods and services consumed by a farmer expected to fall in the future, their present consumption is less, and hence saving is more. In this case the probability of loan repayment fully on time will high. Secondly, extra expenditure during different social activities like annual celebration, and wedding. And in each activities there was competition among each households of the farmers in which extravagancy was mentioned. The other was the nature of the smallholder farmers: in nature some smallholder

farmers were save more while the others save less. Such, borrowers have high probability in the loan repayment at the study area.

VI. Conclusion, Findings and Suggestions

Conclusion and Findings

This study aimed to investigate and analyze loan repayment practice of Farmers and its Determinants in Amigna Gesgar Districts, Arsi Zone, Oromia Regional State, Ethiopia by employing cross sectional data which was collected in 2010/11 E.C. To achieve the objectives of the study mainly primary data was collected from 211 sample size from four selected *gandas* of the district. In the analysis of the collected data both descriptive and econometrics model was used. This study were conducted to identify socio-economic and institutional factors affecting loan repayment. In order to improve and enhance the life of smallholder farmers and rural economy, credit and saving institution is very important because of: poor households are too poor to save, poor to bridge consumption, thus unable to help them; poor farmers lacked access to formal credit services; the supply of institutional credit is an essential requirement for (agricultural) development regardless of demands; its credit should be cheap (subsidized) due to smallholder farmers are poor to afford market interest rates.

The result of the study demonstrates that, the general determinants and constraints of loan repayment were age, education level, purpose of the loan, experience on business, dependency ratio, wealth level, expectation on price of goods and services, marital status, and the nature the smallholder farmer or borrower; and the expenditure level on social festivals like during annual holidays, weddings, and others social factors were identified identifies as the major determinants in the study. Additionally, the of binary logit regression model result shows that the wealth of the farmer (which includes both farm and non-farm income of the farmer), the purpose of the money borrowed, the experience of the farmer (borrower) in business, and dependency ratio were significant at 5% probability level in influencing the dependent variable, the probability of repayment of the loan, the money borrowed by the farmer. The descriptive statistics results showed that about 30.34% and 69.66% percent of sample borrowers were defaulters and non-defaulters respectively.

The purpose of the money borrowed affected loan repayment performance positively and significantly. This is due to the fact that those borrowers who participate in business activities rather for consumption purposes, their probability to pay the loan was high, because they were earn more income from the business or investment(s). As a result explained in econometric model of the study, as a smallholder farmer (the borrower) increases the money borrowed for investment purpose by one unit (going from 0 to 1), the probability of repayment of loan increases by 6.92 times greater, given that all of the other variables in the model are held constant.

The second explanatory variable which has a significant impact on the dependent variable in the model was the dependency ratio of households of smallholder farmer (borrower); it affected loan repayment performance negatively and significantly. Here the collected data shows that those households borrows who's their number of children was large the dependency ratio become; and as a result the probability of the loan repayment become low. In short according to the result of the model, the probability of repayment of loan increases by 0.108 times less, given that all of the other variables in the model are held constant. The third explanatory variable which was significant in the model was the experience the smallholder farmer/the borrowers. The collected data shows that those households borrows that as the experience of the farmer (borrower) in business activities the probability of repayment of loan increases by 2.27 times greater, given that all of the other variables in the model are held constant. The final independent variable that was positively and significantly affect the independent variable, the probability of loan repayment was wealth the smallholder farmer of households (as borrower). And the result shows that as the wealth of smallholder farmer (the borrower) increases by one percent, the probability of repayment of loan increases by 1.01 times greater, given that all of the other variables in the model are held constant.

Suggestions

Based on the findings of this study, the researcher found it important to make some recommendations to guide the enterprises, other concerned bodies and researches.

- Microfinance officials, and smallholder farmers (borrowers) should be trained by professionals how to develop business plan. The culture of cooperation, and formal and informal should be improved by taking the work of successful enterprise repayment period should be revised, because to be profitable and repay the loan easily adequate repayment period is required.
- Additionally, there was a problem of smallholder farmers' attitude toward business activities in general; thus, government (concerned body) should deeply create awareness on how to create business and success in the business process for smallholder farmers (borrowers) at the study area.
- The smallholder farmers of the study are should minimize extra expenditure during different social activities like *wedding*, and annual festivals.
- The members of farmers' households should stay single until they have sufficient income for their family to

- live independently; due the result of the study shows that single/unmarried farmer save more than those non-single/married and their probability of loan repayment was high as explain indirectly under dependency ratio.
- The government should construct the concrete asphalt which connects to Adele Town to Adama/Assela to support small farmers in providing their products in supplying at center market in order to get the balanced price of their outputs; as a result their income increases and the probability of loan repayment will be high.

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