

***Determinants of Loan Repayment: A Case Study in Development
Bank of Ethiopia, West Region***

*A Thesis Submitted to the School of Graduate Studies of Jimma University in
Partial Fulfillment of the Requirements for the Award of the Degree of
Master of Science (MSC) in Accounting and Finance*

By

TESFAYE MEKONNEN MELESSE



JIMMA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

MSC IN ACCOUNTING AND FINANCE

JUNE 2015

JIMMA, ETHIOPIA

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Under the Guidance of

Daniel Tolesa (Asst. professor)

And

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MSC IN ACCOUNTING AND FINANCE

JUNE 2015

JIMMA, ETHIOPIA
JIMMA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
MSC IN ACCOUNTING AND FINANCE PROGRAM

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JUNE 2015

CERTIFICATE

This is to certify that the thesis entitles “*Determinants of Loan Repayment: A Case Study in Development Bank of Ethiopia, West Region*”, submitted to Jimma University for the award of the Degree of MSC in Accounting and Finance and is a record of bona fide research work carried out by Mr. *Tesfaye Mekonnen Melesse*, under our guidance and supervision.

Therefore, we hereby declare that no part of this thesis has been submitted to any other university or institutions for the award of any degree or diploma.

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DECLARATION

I hereby declare that this thesis entitled “*Determinants of Loan Repayment: A Case Study in Development Bank of Ethiopia, West Region,*” has been carried out by me under the guidance and supervision of Daniel Tolesa (Asst. professor) and Mohammed Sultan (MSc).

The thesis is original and has not been submitted for the award of any degree or diploma to any university or institutions.

Researcher’s Name

Date

Signature

Abstract

Development banks are state-backed financial institutions that are concerned with the provision of long-term loans to not only profitable projects but also to socially beneficial ones. This study was conducted on the Determinants of loan repayment; a Case of Development Bank of Ethiopia, West Region. The main objective of this study was to identify and analyze the determinants of loan repayment in DBE, West Region. The study was applying mainly primary and secondary data. The primary data were collected from 104 selected borrowers through questionnaires and interview with staffs and bank managers. For sample selection, stratified random sampling was used where borrowers stratified based on their loan status. The binary logistic model was used to identify the determinants of loan repayment of borrowers. The characteristics of borrowers, factors in the side of lender institution, project and loan related factors and the other external factors were analyzed through descriptive statistics such as frequencies, percentages, mean, and standard deviation. Educational qualification of borrowers, marital status, and proper loan appraisal, grace period of the project, timely loan disbursement, and form of loan disbursement were influence on loan repayment significantly and negatively. Based on the analysis, the researcher is recommended that to the bank to undertake proper loan appraisal, disbursing loan at the right time , adjusting grace period based on the nature of projects and the difficulties they faced to have good loan repayment.

Key words; *Loan Repayment, Bank, borrowers*

Acknowledgment

First, I am heartily thankful to my ALMIGHTY GOD who helps, guides, shapes me to accomplish the works throughout my life.

Next, I am thankful to my main advisor Daniel Tolesa (Asst. Professor) and Co-advisor Mohammed Sultan (MSc) for their incalculable and constructive comment, suggestions, and assistance from the early stage to the completion of this study.

Thirdly, I would like to express my enormous gratitude to all of my families' especially for my mother Ayehu Mekonnen and my father Mekonnen Melesse and relatives for their encouragement in completing this thesis.

Lastly, my grateful gratitude goes to my staff members for their great assistance while doing this thesis and for those who assist me in every aspect while I was at the research work.

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ACRONYMS

- ADLI:** Agricultural Development Led Industrialization
- CLRM:** Classical Linear Regression Model
- DBE:** Development Bank of Ethiopia
- DTI:** Deposit Taking Institutions
- KYC:** Know Your Customer
- MC:** Multi Collinarity
- MFI:** Micro-finance Institution
- NBE:** National Bank of Ethiopia
- N.D:** No date
- NDTI:** Non-Deposit Taking Institutions
- NPLs:** Non-performing Loans
- OLS:** Ordinary Least Square
- PRLR:** Project Rehabilitation and Loan Recovery Process or teams
- SWOT:** Strength, Weakness, Opportunity and Threat
- VIF:** Variance Inflation Factor

CHAPTER ONE

INTRODUCTION

This chapter presents the background of the study, statement of the problem, research questions, study objectives (both general and specific objectives), significance of the study, scope, limitation of the study and organization of the study.

1.1. Background of the study

Financial institutions serve as intermediaries by channeling the savings of individuals, businesses, and governments into loans or investments. They often serve as the main source of funds for businesses and individuals. The most important financial institutions are commercial banks, mutual funds, security firms, insurance companies, and pension funds.

There is distinction that lies between ‘deposit-taking institutions (DTIs) and ‘non-deposit-taking institutions’ (NDTIs) Deposit-taking institutions are organizations such as banks whose liabilities (assets to lenders) are primarily deposits. These can be withdrawn at short notice and usually form part of the national money supply (Peter and Keith, 2007).

The term bank refers to an institution that deals in money and provides other financial services. Banks accept deposits, make loans, and derive a profit from the difference in the interest rates paid and charged respectively. Some banks also have the power to create money (Fasil and Merhatbeb, 2009).

Development banks are state-backed financial institutions that are concerned with the provision of long-term loans to not only profitable projects but also to socially beneficial ones (Hüseyin, et al., 2010).

Development banks fill a gap left by undeveloped capital markets and the reluctance of commercial banks to offer long-term financing. The form (share equity or loans) and cost

of financing offered by development banks depends on their cost of obtaining capital and their need to show a profit and pay dividends (Fasil and Merhatbeb , 2009).

Since very often lending begins at the stage of the formulation of project itself, development banks are also involved in decisions such as choice of technology, scale, and location. This require more than just financial expertise, so that development banking institutions build a team of technical, financial and managerial experts, who are involved in the decisions related to lending and therefore to the nature of the investment. They undertake entrepreneurial functions, such as determining the scale of investment, the markets to be targeted by industry, and extension functions, such as offering technical support (Chandrasekhar, 2011).

The Development Bank of Ethiopia is a strategic development financial institution established to promote the objective of national development. Accordingly, a national mission is bestowed on the bank to promote development by providing credit services and products such as new loans, expansion loans, loan transfers, and loan buy out, syndicate financing and guarantee service. DBE extends credit for short-term, medium, and long-term loans. The term of loans to be determined based on the specific needs and requirements of projects (DBE, 2011).

The loan process of the bank is designed to serve the customer with a shortest possible time, minimum cost, and high quality. This process encompasses the four independent loan-processing units namely (credit, project appraisal, loan approval and PRLR) process and team at corporate and regional level respectively to handle loan-processing activities at various stages and responsibility.

In pursuit of this objective, also the bank is required to carefully assess and evaluate development projects submitted for financing. It also guarantees that resource is invested in cost effective development operations and the means of its repayment is properly reinforced (DBE, 2008).

The main challenge confronting the DBE is the growing size and ratio of NPLs, which is a double sword as it is a reason for provision and other administrative charges and on the other hand drastically reduces the banks income and profitability due to suspension of

interest on NPLs. This undesirable fact tarnishes the image of the bank and negatively contributes to play its part in the countries development endeavours. Besides, ties the bank's capital, affects its liquidity position, and reduces its competitive stance locally or in the global market and hence not compatible with a development bank that is expected to play an active and indispensable role by maintaining its sustainability (DBE, 2009).

1.2. Statement of the Problem

Development Bank of Ethiopia is a specialized financial institution established to promote the national development agenda through development finance and close technical support to viable projects from the priority areas of the government by mobilizing fund from domestic and foreign sources while ensuring its sustainability.

DBE's main area of focus is provision of working capital, medium and long-term loans for investment projects in the government's priority areas. In line with the Agriculture Development Led Industrialization (ADLI) strategy of the country, the Bank provides finance to encourage investment in agriculture, manufacturing and industries preferably export focused.

The Bank's vision is "100% success for all financed projects by 2020." However, projects financed by the Bank with huge loan portfolio faces different challenges, which have a direct impact on the operational performance as well as in attaining the vision of the Bank (DBE, 2014). These different challenges of the projects hinder the bank not to collect the amount of loan from its customers /borrowers as per the schedule and create a hesitation for the achievement of its vision by 2020. Thus, these challenges contribute a lot to fail in collection, un-attainment of its vision, and corrective measures are mandatory to be taken.

The effect of default problem experienced in DBE as it has been shown on its financial position. For instance, as of June 30, 2014 annual report of the bank; NPL's actual performance was 8.23% to total loan outstanding .The NPL ratio of West Region was 14.35%. From the total NPL, the share of West Region was 6.23% to the bank and 19.59% to the regional offices. This annual report of the bank also demonstrates, rate of fresh entrants to NPLs was 2.58%. However, the acceptable level of NPL is below 5% as

of NBE's directives No. SBB/ 43/2008. These all facts indicate that there is a lag/ problem of collection according to the repayment schedule of the bank's different operating units and borrowers' contractual agreement. Therefore, the question is that, why borrowers are not repaying their loan as per their contractual agreement?

1.3. Research Question

The main aim of this research is to answer the revolving problems in loan repayment in Development Bank of Ethiopia, West Region. Therefore, this research tries to answer the following questions;

1. What are the major characteristics of borrowers' that influence loan repayment?
2. What are the major contributing factors in the side of the lender /DBE that affect loan repayment?
3. What are the projects and loan related factors that influence the repayment performance of the clients?
4. What are the external determinant factors for loan repayment in DBE, West Region borrowers?

1.4. Objectives of the Study

1.4.1. General Objective

The main objective of this study is to analyze and identify the major determinants of loan repayment in Development Bank of Ethiopia, West Region.

1.4.2. Specific Objectives

The specific objectives of this study are:

- To identify the characters of borrowers that influence loan repayment.
- To analyze the financing institution (lender) side factors that affect loan repayment performance of borrowers in West Region.
- To identify the projects and loan related factors that influences the loan repayment of borrowers.
- To identify the other factors (constraints) that affect borrowers to timely loan repayment.

1.5. Significance of the Study

One of the key factors for profitability and sustainability of banks' is the presence of good loan repayment rates. The ability of borrowers to repay amount of loans is crucial for the long-term provisions of the credit institutions. However, there are factors that affect the loan repayment performance. Analyzing such factors and formulating proper solutions are essential to expand the activities of banks in a sustainable manner. As a result, this study tries to identify the determinants of loan repayment in DBE, West region. Although the study is limited to West region, its findings are expected to somehow reflect some of the common features of other regions of the bank due to the lending rules and procedures of the bank are the same in all its corporate level, departments, regions, branches, and sub branches. In addition, this study will serve for the other researchers as a reference. Finally, the research findings will be used by the bank for its best achievement in relation to loan repayment.

1.6. Scope and Limitation of the Study

This study focused on DBE, West Region on determinants of loan repayment; because it is the forefront, financial institution engaged on financing development oriented investment projects in the South West of the country and its easily accessible to the researcher. Therefore, this study did not include other regions & head office and other determinant variables like outreach, loan repayment performance in the bank and using innovative features of the bank. The projects financed by West Region are dominantly commercial agriculture & agricultural related products and some service sector projects only. Thus, this study did not include the industrial sector. The other limitation faced for this study was lack of empirical literatures especially in loan repayment in banks.

1.7. Organization of the Thesis

The remaining chapters of the study organized as follows. The second chapter deals with a review of theoretical and empirical literature work done in relation to loan repayment in financial institutions. The third chapter presents the method of sampling, data collection and estimation technique employed to come up with empirical result. The fourth chapter presents result and discussion. The fifth chapter consists of the conclusion and recommendations.

CHAPTER TWO

REVIEW OF LITERATURE

This chapter begins with presenting the theoretical review of qualifying for credit, loan, performing loan, defaulting loans & causes and loan classification by DBE. Next, the empirical review of studies presented. This, empirical studies include studies on other countries and studies in Ethiopia are reviewed by focusing on determinants of loan repayment. At last, the conceptual model presents.

2.1.Theoretical Review

2.1.1. What qualifies you for credit?

Credit grantors gather information, primarily from your credit application and a credit bureau report, to determine whether you will be able and willing to repay your debt. In the final analysis, every credit grantor attempts to answer the question: how risky is it to lend or extend credit to this applicant? This decision is relatively easy for most because the applicants will fall at one end of the continuum or the other of the six “C’s” of credit.

Capacity: - is a factor in determining creditworthiness. It is assessed by weighing a borrower's earning ability and the likelihood of continuing income against the amount of debt the borrower carries at the time the application for credit is made.

Capital:-Factor in determining creditworthiness consisting of a borrower's tangible assets and resources. The presence of sufficient capital in a borrower's profile is an assurance that a debt could be paid from the borrower's assets if the need arose.

Character: - Character is determined by analyzing how a borrower has handled past obligations.

Collateral:-is a real or personal property that a borrower pledges for the term of loan. When the borrower fails to repay, the creditor may take ownership of the property by following legally mandated procedures.

Conditions:-A factor often considered with the factors of capacity, capital, and character when creditors are analyzing an applicant's creditworthiness. This factor consists of

economic conditions that could affect a borrower's ability to repay, such as unemployment, seasonal work.

Common Sense: - A credit grantor might determine that a borrower has good common sense based on how questions are answered from the credit application (William, n.d).

2.1.2. Loans

An arrangement in which a lender gives money or property to a borrower and the borrower agrees to return the property or repay the money, usually along with interest, at some future point(s) in time. Usually, there is a predetermined time for repaying a loan, and generally the lender has to bear the risk that the borrower may not repay a loan.

Proclamation No. 592/2008 and Directive No. SBB/43/2008 of NBE; loans and advances means any financial assets of a bank arising from a direct or indirect advance (i.e. participation in a loan syndication, the purchase of loan from another lender etc.) or commitment to advance funds by a bank to a person that are conditioned on the obligation of the person to repay the funds, either on a specified date or on demand, usually with interest. The term includes a contractual obligation of a bank to advance funds to or on behalf of a person, claim evidenced by a lease of financing transaction in which the bank is a lessor, and an over draft facility to be funded by the bank on behalf of a person. The term does not include accrued but uncollected interest or discounted interest.

M. Radha, and SV. Vasudevan(1980 cited in Tihitina, 2009,p. 10-11)," loans and advances are the most profitable of all the assets of a bank. These assets constitute the primary source of income by banks. As a business institution, a bank aims at making a huge profit. Since loans and advances are more profitable than any other assets, it is willing to lend as much of its funds as possible. However, banks have to be careful about the safety of such advances."

2.1.3. Performing Loans

Legally, a loan or credit facility refers to a contractual promise between two parties where one party, the creditor agrees to provide a sum of money to a debtor, who promises to return the said amount to the creditor either in one lump sum or in installments over a

specified period. The agreement may include provision of additional payments of rental charges on the funds advanced to the borrower for the time the funds are in the hands of the debtor.

The additional payments that are in the form of interest charges, processing fees, commissions, monitoring fees among others, are usually paid in addition to the principal amount lent. A loan may therefore be considered as performing if payments of both principal and interest charges are up to date as agreed between the creditor and debtor. The foregoing reveals that loans that are up to date in terms of principal and interest payments are described as performing facilities. Repayments of loans are an important factor that shows the efficiency of management in terms of risk analysis and monitoring (Yasir, et al., 2012).

2.1.4. Defaulted Loans

There is no global standard to define non-performing loans at the practical level. Variations exist in terms of the classification system, the scope, and contents. Loan default can be defined as the inability of a borrowers to repay the loan as agreed when due. The underlying assumption is that every borrower has the intention and willingness to repay the loan, but there are certain factors that frustrate their intentions (DBE, 2008).

The fast increase in NPLs not only increased banks' vulnerability to further shocks but also limited their lending operations with broader repercussions for economic activity. Higher quality of the bank's management, as measured by the previous period's profitability, leads to lower NPLs, while moral hazard incentives, such as low equity, tend to worsen NPLs. In addition, excessive risk taking (measured by loans-to-assets ratio and the growth rate of bank's loans) was found to contribute to higher NPLs in the subsequent periods (Nir Klein, 2013).

Loans that are outstanding in both principal and interest for a long time contrary to the terms and conditions contained in the loan contract are considered as non-performing loans. Available literature gives different descriptions of bad loans. Some researchers noted that certain countries use quantitative criteria for example number of days overdue scheduled payments while other countries rely on qualitative norms like information

about the customer's financial status and management judgment about future payments (Teshome, 2010).

Default occurs when a debtor has not met his or her legal obligations according to the debt contract. For example, a debtor has not made a scheduled payment, or has violated a loan covenant of the debt contract (Ameyaw-Amankwah, 2011). Loan default can be defined as the inability of a borrower to fulfill his or her loan obligation as at when due (Balogun and Alimi, 1990).

2.1.5. Causes of Non-Performing Loans

The non-performing loans are a result of the compromise of the objectivity of credit appraisal and assessment. The problem is aggravated by the weakness in the accounting, disclosure, and grant of additional loans. In the assessment of the status of current loans, the borrower's credit worthiness and the market value of collateral are not taken into account thereby rendering it difficult to spot bad loans. The causes for loan default vary in different countries. It extends from borrower's specific act to bank's weak regulatory mechanism in advancing loans and monitoring procedures (Tihitina, 2009).

Reduced Attention to Borrowers

"Few of the loan defaults that make trouble for banks can be blamed on reduced attention to borrowers. Borrowers give better attention to the loans that they borrowed when they have the perception that better attention is given to them. Lending officers of institutions should try to keep up with their loans, visiting the borrower's premises at least once a year or up to a half a dozen times a year on larger loans" (Mayers, Supra, cited in Tihitina, 2009, p. 17).

Macroeconomic Instability

"Macroeconomic stability and banking soundness are inexorably linked. Both economic theory and empirical evidence strongly indicate that instability in the macroeconomy is associated with instability in banking and financial markets and instability in these sectors is associated with instability in the macro economy. Most problems of poor loan quality faced by banks were compounded by macroeconomic instability" (George G.

Supra cited in Tihitina, 2009, p. 18)." Macroeconomic instability, which is mostly manifested by high inflation rate, also makes loan appraisal more difficult for the bank, because the viability of potential borrowers depends upon unpredictable development in the overall rate of inflation, its individual components, exchange rates, and interest rates. Moreover, asset prices are also likely to be highly volatile under such conditions. Hence, the future real value of loan security is also very uncertain "(Martin Brownbrigde, 1998 cited in Tihitina, 2009, p.19).

Unsound Assessment Mechanism and Weak Risk Consciousness

Risk, and the ways, in which it can be identified, quantified and minimized, is key concerns for a bank's management and its auditors when they are considering the need to provide for bad and doubtful loans. No loan is entirely without risk. Every loan, no matter how well it is secured, and no matter who is the borrower, has the potential to generate loss for the lender. It is the degree of risk to which a loan is susceptible and the probability of loss that vary; these should normally be reflected in the interest margin and other terms set at the inception of the loan.

There are situations under which setting performance indicators ignored risk-adjusted revenues. Most of the time, little emphasis is given on risk control and exit management. Heavily relying on the materials provided by managers and only reviewing the written reports and financial reports do not make risk review mechanism conscious. A bank should conduct due diligence by making every possible examination available (C. Brown, Supra cited in Tihitina, 2009).

2.1.6. Loan Classification by DBE

One common and major technique used for the monitoring of past due loans is age analysis and loan classification system by age. In this system past due loans are classified under five different categories based on the age of the portion of the loan that has fallen in arrears (DBE, 2008).

- **Pass loans:** these are the loans that have not become any problem, present no special risk than the normal risk inherent to any loan. Short term loans past due for less than 30 (thirty) days and medium and long-term loans past due for less than 90 (ninety) days.

- **Special mention loans:** these are the loans that have shown some early signs of trouble, such as missing one payment, missing a few financial statements, deterioration of the collateral, etc. Some other events not under the borrower's control may also trigger some alarm, such as deterioration of the labor or political or security situation in the area where the business is located.
 - Short term loans past due for 30 (thirty) days or more, but less than 90 (ninety) days and medium and long-term loans past due 90 days or more, but less than 180 days.

- **Substandard loans:** - these are the loans that have become real problems, missing payments for two consecutive payments. They also present real weaknesses that jeopardize the orderly liquidation of the loan. The following non-performing loans at a minimum shall be classified substandard:
 - Short term loans past due 90 days or more, but less than 180 (one-hundred-eighty) days;
 - Medium and long term loans past due 180 days or more, but less than 360 days

- **Doubtful loans:** There are very serious questions about the borrower's capacity to repay, leaving the bank with a strong possibility of loss, at least partial loss. The following non-performing loans at a minimum shall be classified doubtful:
 - Short term loans past due 180 (one-hundred-eighty) days or more, but less than 360 days;
 - Medium and long term loans past due 360 (three-hundred-sixty) days, but less than 3 years.

- **Loss Loans:** these are loans that are beyond hope after all means of recovery have been exhausted, or loans that have not been performing for over 1 year. The only course of possible action is to take legal actions to foreclose and write the loans off the book as a loss.
 - Short term loans past due 360 (three-hundred-sixty) days or more;
 - Medium and long term loans past due 3 (three) years or more;

Based on the above classification the loan of the banks considered as performing and non-performing. If the loan fall under pass and special mention category they are classified as performing loan otherwise it is considered as non-performing loan (DBE, 2014).

2.2. Empirical Review

A number of socio-economic and institutional factors affect loan repayment positively and negatively. Regarding to the loan repayment performance of borrowers several studies have been conducted in many countries by different authors. However, almost all has done in microfinance any how some of the studies summarized as below.

2.2.1. Studies in Other Countries

Awoke (2004) described that large rate of default has been a recurrent problem in most agricultural credit schemes organized or supported by governments. Most of the defaults arose from poor management procedures, loan diversion, and unwillingness to repay loans. For this reason, lenders devise various institutional mechanisms aimed at reducing the risk of loan default (pledging of collateral, third-party credit guarantee, use of credit rating and collection agencies, etc.). In the context of providing credit to the rural asset-poor, what is required is institutional innovation that combines prudent and sustainable banking principles with effective screening and monitoring strategies that are not based on physical collateral (such as land).

Ibeleme, et al. (2013) investigated that loan size and repayment performance of smallholder oil palm producers and processors in Nigeria, Abia State as a case study. Ninety respondents, comprising 54 producers and 36 processors, selected randomly and interviewed. Ordinary Least Square technique was used in analyzing the data and drawing conclusions. The analysis of data revealed that loan size by oil palm processors was significantly determined by processing experience, gross annual income, and interest rate. For the farmer-borrowers, the major determinants of loan size were educational level and interest rate all of which fell in line with a prior expectation as indicated by the signs of the coefficients of relevant variables. On loan repayment rate and credit worthiness rating, results of data analysis showed that loan-asset ratio and distance between home and source of loan were significant determinants of loan repayment rate.

Yasir, et al. (2012) analyzed different factors affecting the repayments of agricultural credit in district Kasur of Punjab province. Purposive sampling was adopted and 60 respondents were selected after booting a list of defaulters from respective branches of

UBL. The researchers used well-structured questionnaires for data collection from the respondents. The data were summarized using descriptive statistics and found that sloppy supervision by the bank employees, miss-utilization of loans, high interest rate and change in business/residential place of the borrowers etc caused delay in repayments of agricultural credit in a case study of District Kasur of Punjab Province.

Munene, et al.(2013) studied the Microfinance institutions in Kenya to establish the causes of repayment defaults in Imenti North District, Kenya using a descriptive survey design by incorporating 400 respondents of individual microfinance loan beneficiaries and microfinance institution officials using census and cluster sampling procedures for micro finance institutions officers and loan beneficiaries respectively . The data collected using both structured and unstructured questionnaires and analyzed using descriptive and inferential statistics. The result of the study revealed that there was significant relationship between the type of business, age of the business, number of employees, business profits and loan repayment default. The study further indicates a strong link between technical training for loan beneficiaries and the performance of entrepreneurial businesses among the remote communities.

Tundui and Tundui (2013) examined the sources and determinants of loan repayment among women microcredit clients in Tanzania by taking 286 business owners in random sample. The results have demonstrated that business skills and management practices play a very significant role, household size, the number of household members with fixed salaries and decision making regarding loan use to have a significant influence on loan repayment.

Mohammad & Hooman (2008) investigated the factors influencing on repayment behavior of farmers that received loan from agricultural bank by using a logit model and a cross sectional data of 175 farmers of Khorasan-Razavi province. Results showed that farmer's experience, income, received loan size and collateral value have positive effect while loan interest rate, total application costs and number of installment implies a

negative effect on repayment performance of recipients. Farming experience and total application costs are the most important factors for the model respectively.

Theresa, et al. (2014) examined the determinants of loan repayment among cooperative farmers in Awka North L.G.A of Anambra state, Nigeria. This study examined the determinants of loan repayment using SPSS version 17. The study provides empirical evidence on the farmers' socio-economic characteristics as well as determine which of the characteristics that influence loan repayment, the range of amount of loan applied for, amount received and amount repaid by the cooperative farmers and organizational factors affecting the farmers' credit repayment ability. Two coefficients (educational qualification and farm size) are significant at 5%; and (loan application cost and collateral value) are significant at 1% respectively. Age, membership duration, and income of the farmers were not significant but it shows a positive relationship with loan repayment. There was a significant difference between the amount of loan received and amount repaid by the cooperative farmers. All the organizational factors affecting the farmers' credit repayment ability were significant at 0.000 significant levels.

Osakwe and Ojo (1986) found that large rate of default has been a perpetual problem in most agricultural credit schemes organized or supported by Nigerian government. Most of the defaults arose from poor management procedures, loan diversion, and unwillingness to repay loans.

Oladeebo and Oladeebo (2008) confirmed that income, sex, farm size, age of farmers, years of farming experience with credit, size of loan, household size, timeliness of loan disbursement, level of education of farmers, sales of crops, degree of diversification, income transfer and the quality of information were positive and significant determinants of agricultural credit repayment.

Koopahi and Bakhshi (2002) identified defaulter farmers from non-defaulters of agricultural bank recipients in Iran by using a descriptive analysis. They found use of machinery, length of repayment period, bank supervision on the use of loan had

significant and positive effect on the agricultural credit repayment performance. In the other hand incidence of natural disasters, higher level of education of the loan recipient and length of waiting time for loan reception had a significant and negative effect on dependent variable.

The research conducted by Chirwa (1997) to assess the determinants of the probability of credit repayment among smallholders in Malawi using a model of probit. This model allows for analysis of borrowers as being defaulters or non-defaulters. The five factors namely sales of crops, size of group, degree of diversification, income transfer and the quality of information were over and over again significant determinants of agricultural credit repayment.

Afolabi (2010) examined loan repayment among small-scale farmers in Oyo State, Nigeria. A multi stage sampling technique was used to select 286 respondents in the study area and structured questionnaire administered on them to collect data. Descriptive statistics was used to analyze the socio-economic characteristics of the respondents while multiple regressions using ordinary least square (OLS) to quantitatively determine the socio-economic characteristics that influence the level of loan repayment .The descriptive result showed that 60.23% of the respondents were more than 50 years old and 92.35% of them were males. Analysis also revealed that 83.92% of these farmers operated 4.9 hectares or less as farmland. About 82.17% of the respondents obtained their loans from informal sources while 17.83% patronized formal sources. The estimated coefficients had positive signs, which indicate that an increase in the quantity of these variables would lead to an increase in the level of loan repayment among the respondents keep other things constant. The coefficients of family size and non-farm expenses that had negative sign implied that an increase in these variables would lead to a decrease in level of loan repayment.

Josephat, etal. (2013) studied the determinants of seasonal loan default among beneficiaries of a state owned agricultural loan scheme in Uasin Gishu County, Kenya. It specifically identified socio-economic characteristics of the respondents and

quantitatively determined some socio-economic characteristics of these farmers that influence loan default. The study employed a stratified random sampling technique to select 272 small-scale farmers who took seasonal loan in the period 2005 to 2010 in Uasin Gishu County. Descriptive statistics was used to analyze the socio-economic characteristics of the respondents. Cross tabulation was used to present a summary of data related to the determinants and logit regression analysis, quantitatively determined the probability of default given the factors that influence loan repayment among the respondents in the study area. The results of the logistic regression indicated that personal factors and facility factors were both significant at 1% and farming conditions were not significant. These results show that measures to lower loan default should focus more on personal and facility factors rather than farming conditions.

Yacob (2014) analyzed the socio-economic factors that affect the institution's loan repayment performance Eritrean Saving and Micro Credit Program of Dekemhare Sub-Zone using the stratified sampling technique. The data collected from a sample of 134 respondents, which were 67 defaulters and 67 non-defaulters. A structured questionnaire was used to collect the primary data and descriptive statistics and the probit model were employed to analyze the data. The socio-economic characteristics of the respondents were described using averages, percentages while the factors influencing loan repayment performance of the saving, and Micro Credit Program loans were analyzed using the binary probit regression model. Results of the regression analysis revealed that the level of education, loan amount and loan category have insignificant effect on the probability of the loan repayment. On the other hand, age, gender, type of business and credit experience are significant determinants where age and type of business have negative relationship and gender and credit experience have positive relationship with the loan repayment probability.

Norhaziah and Mohd (2013) on the study of loan repayment problems in micro- finance programs that use individual lending approach, applied qualitative analysis through in-depth interviews with microfinance institution staffs and clients in Peninsular Malaysia. The researchers did face-to-face interviews where 30 respondents were selected equally

from good borrowers, delinquent borrowers, and default borrowers .In addition, six microfinance institution state managers in Peninsular Malaysia were chosen to get in depth information about borrower's behavior towards their loan repayment performance. Based on the interview with micro-finance institution state managers, the result found that business characteristics are the main factor to be good borrowers where if the borrowers have a good business and can make a profit, they can payback the loans on time but if their business loss or failed, it can ruin their loans repayment. Besides, borrower's attitude towards their debt was also the main reason in determining loan repayment performance. Borrowers who set their mind that every debt must be repaid have higher chances to repay on time. The result also stated that borrowers who have regular savings tend to become good borrowers. These borrowers usually manage their income well and are not lavish with the profit received. Generally, the result stated that the factors affecting the ability of the borrowers to repay their loans were business factors, borrower's attitude towards their loans, other debt burden, amount of loan received, business experience, and family background.

Awunyo-Vitor (2012) searched the determinants of loan repayment default among farmers in Brong Ahafo region of Ghana. The study employed Probit model to investigate factors that influence farmer's loan repayment default. Data used in this study was gathered through a survey of 374 farmers in five districts within Brong Ahafo region of Ghana. The results showed that farm size, and engagement in off farm income generating activities reduces the likelihood of loan repayment default significantly. In addition, larger loan amount and longer repayment period as well as access to training are more likely to reduce loan repayment default.

Concerning business characteristics, Oke et al. (2007) found that any business that is making profits is more likely to enable owners repay their loans.

Alex Addae-Korankye(2014) analyzed the causes and control of loan delinquency/default in microfinance institutions in Ghana. Random sampling technique was used to select twenty-five microfinance institutions and two hundred and fifty clients for the study. Questionnaire and interview guide were used to collect data for the study. The study used survey design involving both quantitative and qualitative approaches. The study found

the causes of loan default include; high interest rate, inadequate loan sizes, poor appraisal, lack of monitoring, and improper client selection.

Kodongo and Kendi (2013) evaluated the causes of delinquency in microfinance lending programs of Kenya using the logistic regression model.

2.2.2. Studies in Ethiopia

Abebe Mijena (2011) studied the determinants of credit repayment and fertilizer use by cooperative members in Ada District, East Shoa Zone, Oromia Region. Data for this study were collected both from secondary and primary sources. A two-stage random sampling procedure was adopted to select five agricultural cooperatives and a total of 130 sample respondents from the district. Moreover, differences between defaulters and non-defaulters with respect to the selected variables were tested using t-test and χ^2 -test. The demographic, socio-economic, and institutional characteristics of the respondents and other variables related to timely credit repayment (defaulters and non-defaulters) and input use were analyzed using descriptive statistics. Two-limit Tobit model result showed that family size, livestock ownership, on-farm income, non-farm income and saving habit were the statistically significant factors influencing timely loan repayment performance positively. On the other hand, multiple linear regression models were used to identify the variables that contributed to the amount of fertilizer use among respondents. While age of the household head influences it significantly and negatively.

Abreham (2002) conducted a research with the aim of identifying the major factors behind the loan default problem of small-scale enterprises with particular reference to Development Bank of Ethiopia (DBE), by employing tobit model. Sample selection was based on stratified sampling and 102 borrowers were selected. The result of econometric model revealed that having other source of income, education, work experience in related economic activity before the loan and engaging on economic activities other than agriculture are enhancing while loan diversion, being male borrower, and giving extended loan repayment period are undermining factors of the loan recovery performance of projects. About the loan, rationing mechanism a conclusion that the bank's rationing mechanism didn't much with the repayment behavior of borrower.

Fikirte K.Reta (2011) studied determinants of loan repayment performance: A case study in the Addis Credit and Saving Institution, Addis Ababa, Ethiopia. This study was conducted with the objective of analyzing and identifying the factors that influence the loan repayment performance of the beneficiaries of Addis Credit and Saving Institution. She used primary data from 200 randomly selected clients (100 defaulters and 100 non-defaulters) by using structured questionnaire. Moreover, secondary data were obtained from the record of Addis Credit and Saving Institution. For the data analysis, descriptive statistics including mean, frequency, and percentages were used to describe the socio-economic characteristics of the borrowers. In addition, t-test and chi-square analyses were employed to compare the defaulters and non-defaulters group. A binary logit model was used to analyze the socio-economic factors that influence loan repayment. Age and five business types (balitina, handicraft etc,) were important in influencing loan repayment performance of the borrower. In addition, sex and business experience of the respondents were found to be significant determinants of loan repayment rate.

Million, et al. (2012) examined the determinants of loan repayment performance among smallholder farmers in East Hararghe Zone, Ethiopia specifically Kombolcha and Babile districts. Structured questionnaire was used to gather information from 140 smallholder farmers. Quantitative data was analyzed using descriptive statistics such as mean, standard deviation, and percentage used. Moreover, a two-limit tobit model was used to select variables which most significantly distinguish between non-defaulters and defaulters of agricultural loan, from a set of personal and socio-economic variables hypothesized to influence repayment behavior. The Two limit tobit regression model results indicate that agro ecological zone, off-farm activity and technical assistance from extension agents positively influenced the loan repayment performance of smallholder farmers, while production loss, informal credit, social festival and loan-to-income ratio negatively influenced the loan repayment of smallholder farmers.

Kibrom (2010) identified that borrower's characteristics, project characteristics and loan characteristics were the determine factors for successful loan repayment performance of the private borrowers in Development Bank of Ethiopia, North Region. The types of data

were mainly primary and secondary. The data collected from 100 respondents and analyzed through probit model. Based on this model, educational level of the borrowers, repayment period, availability of other source of income, sector, purpose of the loan and type of labor determine successful loan repayment performance of the borrowers positively and significantly. Whereas, gender and household size have positive sign, but are not statistically significant. Moreover, variables such as age, loan diversion, other source of credit show negative sign but not statistically significant. The variable experience is statistically significant but show negative sign.

Shaik and Tolosa(2014) studied performance of loan repayment determinants in Ethiopian Micro Finance - an analysis to major socio- economic and loan related factors that determines loan repayment performance of borrowers in Sidama Micro Finance Institution. The study employed explanatory research design with quantitative and qualitative methods. The quantitative aspect of the data focused on description of socioeconomic variables, loan and related variables, and business related variables and analysis of relationship among the dependent and explanatory variables for the study. Multi-stage probability sampling technique was used. The result of binary logistic model show that age, education, time laps between loan application and disbursement, loan size, loan diversion, repayment period, number of dependants, training, and supervision were significant. The coefficients of these all-significant variables were negative except education level and time laps between loan application and disbursement. On the other hand, family size of respondents, repeatedly borrowing, business experience, agricultural type business, and non-agricultural type business were found insignificant. Overall, the binary logistic model successfully predicted factors contributing to 89.9% of micro credit loan repayment problem among Sidama Micro Finance Institution.

According to Addisu (2006), even though studies on the factors determining loan repayment finance institutions borrowers give mixed and overlapping results, the general consensus is that is determined by willingness, ability and other characteristics of the borrowers; businesses characteristics and characteristics of the lending institutions including product designs and suitability of their products to borrowers. Other external

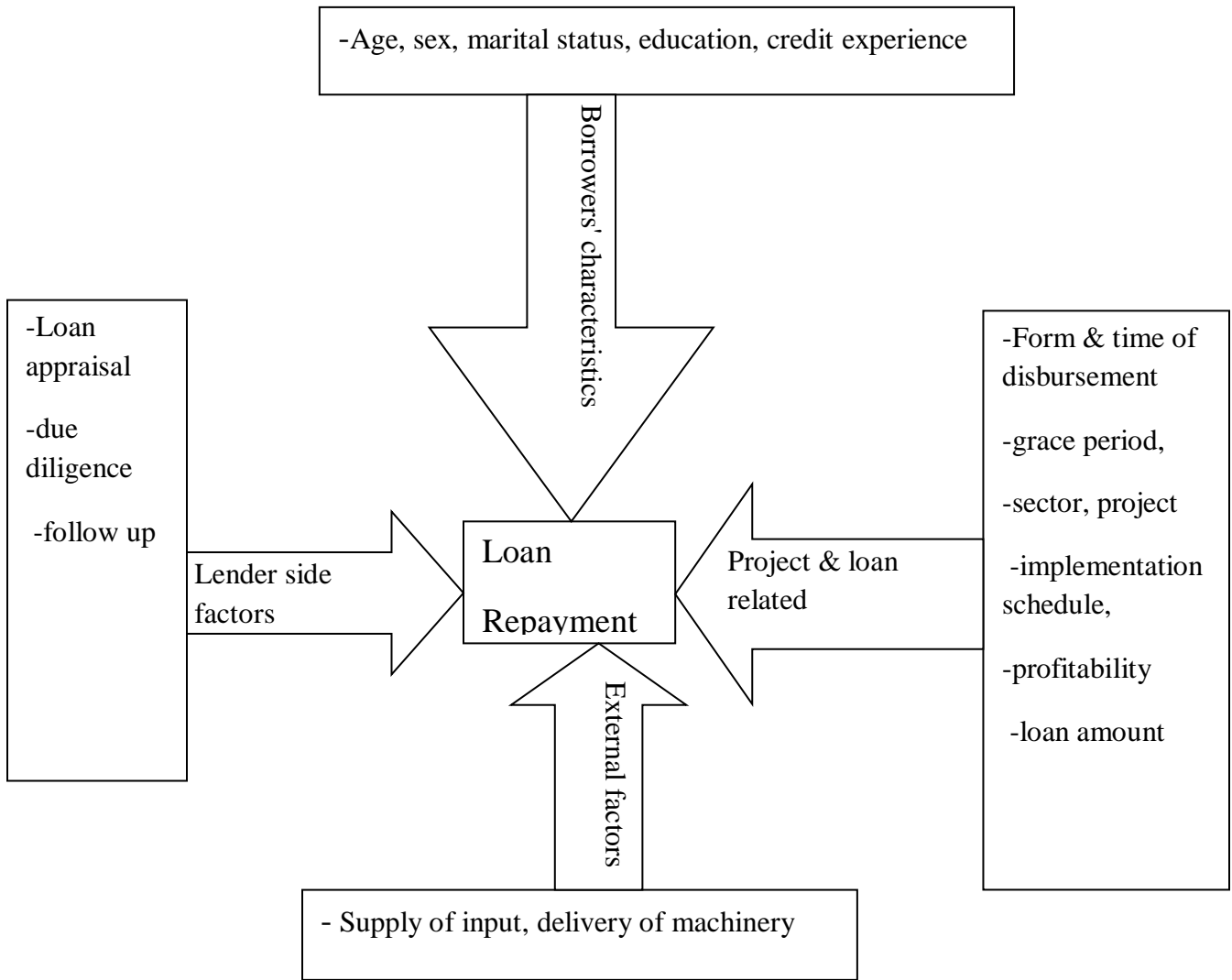
factors such as the economic, political, and business environment in which the borrower operates are also important determinants of loan repayment.

The study of Brehanu & Fufa (2008) said that regarding the characteristics of borrowers, repayment of loans depend on the willingness and ability of the borrowers to repay. Therefore, individual borrowers can either repay their loans or choose to default. Defaults may be intentional or unintentional in contrast, intentional or strategic default can happen due to moral hazard behavior by the borrowers. This happens when borrowers have enough money or have the ability but refuse to repay their loans.

2.3. Conceptual Framework

To identify and analysis the determinants of loan repayment in DBE, West Region, the conceptual model is drawn based on the literatures reviewed. The determinants of loan repayment categorized as borrowers' characteristics, factors in the side of the lender, project & loan related factors and other external factors. Borrowers' characteristics are gender, sex, level of educational by (Oladeebo and Oladeebo, 2008), age, membership duration, and income by (Theresa, et al., 2014). Factors in the side of the lender are appraisal, project monitoring, and client selection (Alex Addae-Korankye, 2014), sloppy supervision (Yasir, et al. 2012). Project & loan related factors are loan sizes, timeliness of loan disbursement (Oladeebo and Oladeebo, 2008), loan diversion, and unwillingness to repay loans (Awoke, 2004), miss-utilization of loans, high interest rate (Yasir, et al. 2012). External factors are use of machinery, incidence of natural disasters (Koopahi and Bakhshi, 2002).

Figure; 2.1 Conceptual frameworks



Source: extracted by the researcher (2015)

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

This chapter discusses the research methodology. It focuses on area of the study, research design, source, & types of data, sampling design, and data analysis technique, description of the study variables and model specification.

3.1. Area of the Study

The area of the study is DBE, West Region. It is located in South West of Ethiopia. The area covers two branches namely Nekemte and Jimma, one PRLR team and six sub branches namely (Agrao, Mizan Teferi ,Ghimbi, Dembi Dollo,Shambu and Mettu sub branch).

3.2. Research Design

Studies concerned with specific predictions, with narration of facts and characteristics concerning individual, group or situation; rigid design, probability sampling design, structured or well thought out data collection are all examples of descriptive research studies (Kothari, 2004). Thus, this study employed both explanatory and descriptive research design with quantitative and qualitative data. It aims to ascertain the determinants of loan repayment a case of DBE, West Region. The data focused on description of borrowers' characteristics, bank related variables, and project and loan related variables and external factor analysis and relationship among the dependent and explanatory variables.

3.3. Source &Type of Data

The study applies mainly primary data. The primary data are those, collected as fresh and for the first time and thus happen to be original in character. Primary data can be collected either through experiment or through survey. In the case of a survey, data collected by through personal interview, questionnaires (Kothari, 2004).

These can use to get qualitative data. The primary data collected through semi-structured questionnaire distributed to the borrowers; and interviews conducted to the bank officials and staffs.

The questionnaire included both close and open-ended questions. The close-ended questions covered the personal information, institutional, external factors, loan and repayment related questions. The open-ended questions dealt with the perception of clients towards the bank and their feelings. All questionnaires translated into Amharic. The questionnaire was pre-tested by three borrowers before conducted for the whole sample. Besides, interviews were made with selected loan officers and managers, and relevant documents were reviewed.

3.4. Sampling Design

If the population from which a sample is to be drawn does not constitute a homogeneous group, then stratified sampling technique is applied to obtain a representative sample. The usual method, for selection of items for the sample from each stratum, resorted to is that of simple random sampling (Kothari, 2004).

Referring on Kothari (2004) note, sample selection conducted based on stratified random sampling where borrowers were selected based on heterogeneous loan status (first period loan repayment not reach, default, and non-default loans). As of February 2015, the total number of borrowers listed in Jimma Branch & West Region PRLR team, Nekemte Branch and the six sub-branches was 509. From the total loans 130 borrowers were staffs (short staff loan), 96 of the borrowers their loan repayment not reach for first repayment in Jimma and Nekemte Branch. The remaining 283 loans were listed in the loan position of the region that at least their first loan repayments mature. Thus, the total population of the study is 283. Of these, 116 of borrowers' were non-defaulters and the remaining 167 borrowers were defaulters (loan status including special mention, substandard, doubtful and loss). According to their loan status, 40.99% of the total populations were credit worthy borrowers while the rest 59.01% were defaulters. Therefore, samples of 104 borrowers selected based on proportional stratified random sampling, out of which 43 non-defaulters and 61 defaulters. In addition, during data collection, four senior employees from each team and two managers randomly selected and interviewed.

3.5. Data Analysis Techniques

After the data have been collected, the researcher turns to the task of analyzing them. The analysis of data requires a number of closely related operations such as establishment of categories, the application of these categories to raw data through coding, tabulation, and then drawing statistical inferences (Kothari, 2004).

Thus, the researcher analyzed the collected data using descriptive statistics (frequencies, percentages, mean, and standard deviation) to obtain information on the determinants of loan repayment and binary logistic econometric model (logit) to analyze the determinants of loan repayment ability of DBE, West Region borrowers. For borrowers who experienced repayment problems, a dependent variable takes a value of 1, whereas, borrowers who did not experienced any repayment the value of 0 was assigned. The SPSS version 16 software used for regress the variables.

3.6. Descriptions of Study Variables

Selection of variables was based on empirical literature on the factors determining loan repayment. While guided by the literature review, the researcher also considered other factors likely to influence loan repayment. To establish the factors determining loan repayment, the researcher summarized in to the characteristics of the borrowers, factors in the side of the lending institution project and loan related and external factors.

3.6.1. Dependent Variable

Loan Repayment; This dependent variable can be explained through the independent variables which specified from the empirical literature.

3.6.2. Independent Variables

The list of independent variables briefly elaborated as follows.

Borrower's characteristics

Personal factors include a combination of age, gender, marital status, level of education, previous credit experience and main source of income.

Age; it is a continuous variable of borrowers in years. This variable arranged as 0 for less than 45 years old and 1 for greater than 46 years old. The younger the age the limited

experience attributed to his/her age and this may lead to default loan repayment. Hence, age contributes to loan repayment in old age expected to have positive part to loan repayment. Thus, the expected sign is positive.

Sex; is a dummy variable taking, 0 for male and 1 for female. The female beneficiaries have a tendency for better loan repayment. This means that lending to women can lead to their economic empowerment and inculcate them a culture of hard work and financial discipline, which can lead to high loan repayment rates, thus women borrowers may have high loan repayment performance. Thus being women expected to have a positive sign on loan repayment.

Marital Status; it is a continuous variable but rearranged as a dummy variable; taking 0 if the borrowers are single, divorced widowed and 1 if the borrowers got marriage. The borrowers who engaged in marriage can have financial management experience in their home. Thus, having such managing experience can be reflected in their loan utilization. The expected sign is negative to being default loan.

Education; this variable also a continuous variable but rearranged a dummy variable for binary analysis , taking 0 if the borrowers are less educated (no formal education, primary education) and 1 if the borrowers are in the secondary educational level, tertiary educational level. The literate borrowers expected to have a negative impact in default loan repayment , because higher level of education enhance borrowers to accept new technology easily , keep business records, conduct basic cash flow analysis, and make the right business decision. Hence, the expected sign is negative to being default loan.

Credit Experience; ; this is a dummy variable, taking 0 if the borrowers have no long credit experience and 1 if borrowers have long credit experience. If the borrowers have no long credit experience, they will not have more stable sales and cash flows than those who have longer credit experience. Thus, those who are no or less experience will have high default rates. Hence, it will have a positive impact on default loan repayment.

Bank Related Variables

Project Appraisal; It is a dummy variable that the thorough project appraisal taking as 1 and otherwise 0. A loan appraisal is a request/application for loan/funds on credit evaluated on its merits by a finance institution. Among others aspects, the purpose of loan, genuineness of its need, its amount, etc are assessed on some parameters before loan is actually granted. Based on this argument proper project appraisal can have negative sign for default.

Due diligence; It is a dummy variable that well done due diligence taking as 1 and otherwise 0. It is an entry point assessment. In this stage the borrowers all round aspects are assessed in relation to its personal characteristics from past to present, fulfillment legal documents to be a creditor, project management , capital adequacy , credit relation and experience , availability of inputs and identification of risk . Therefore, adequate due diligence, the expected sign for being default is negative.

Projects follow up; It is a dummy variable that proper follow up taking as 1 and otherwise 0. It is done at different stage of the project. Project follow up can be done at the stage of project under implementation, during implementation and commencing to commission. Undertaking of fledged follow up as per the schedule boost the projects /customers to accomplish their task duly and the project can generate revenue. The chance of being a default loan is low if proper follow up has done.

Project Characteristics

Sector; it is a dummy variable taking 0 for sectors such as agriculture and agricultural related projects, and 1 for service giving sectors. It is clear that different types of projects have different level of risks. Thus, borrowers with different types of projects may have different repayment rates. However, it is clear that borrowers who engage in agriculture and agricultural related product sectors are expected to have default loan, this is because agriculture and agricultural related projects are seasonal and more exposed to different risks than service sectors. The expected sign for agriculture is positive for default.

Loan Utilization

Form of Disbursement; it is a dummy variable, which take 0 for loan released in cash and 1 for in kind or both. To be fit for the model this variable other than cash adjusted as kind. Releasing disbursement in kind, (loans released to the suppliers on behalf of the loane in exchange for the item supplied to the borrower) will decrease the probability of default. Based on this argument, disbursing in kind has negative relation with default.

Time of Loan Disbursement ; it is a dummy variable, which take 0 for untimely loan disbursement and 1 for the on time disbursement .The bank disburse the loan for the borrowers for a specific purpose based on the project disbursement schedule . Thus, the bank will disburse the loan as per the schedule due to successful accomplishment of the activity by the borrowers and taking timely progress measurement. Therefore, timely disbursing the loan according to the project appraisal schedule can have negative sign with default loan.

Project Implementation

Grace Period; As of Abreham (2002) if large grace period is given, the project will have sufficient time for implementation so that borrowers could properly utilize the loan for the intended purpose and to generate adequate income after it starts operation. Therefore, it will not face repayment problem when the loan due later. Based on this argument, the expected sign of grace period is negative.

Project implementation schedule; When the borrowers deposit cash up front for equity, suppliers deliver machineries and equipments on time, taking timely follow up and progress measurements, the project can be run as expected .Therefore, it will not face repayment problem when the loan due later. Copisarow (2000) found that defaults generally arise from poor implementation. Based on this argument, the expected sign of project implementation schedule is negative.

Financial Situation

Project Profitability; It is a dummy variable, which takes 0 for net loss and 1 for net profit. Balogun and Alimi (1990) also identified the major causes of loan default as non-

profitability of farm enterprises. Some authors link the repayment performance with firm characteristics such as Oke et al. (2007) mention that firm's profit significantly influenced loan repayment. The more profitable projects, the less the probability of being default.

Loan and Loan Repayment

Loan Amount: - this variable is a continuous variable but rearranged a dummy variable for binary analysis, taking 0 if the loan amount up to 11 million and 1 if the loan amount greater than 11 million. Its relation with loan diversion is ambiguous because it all depends on the amount of loan requirement to run a particular project and managerial capacity of the borrower. Increasing the loan size will increase the production capacity leading to better repayment. Thus, the sign of the variable for default negatively.

External Factors

The factors affecting the recovery of loans disbursed by financial institutions were the external problems. The external problems were related to the defaulters, e.g. climatic condition, prices of inputs, less/more loan than required.

Supply of Input; It is a dummy variable, which take 0 for not delivered timely and 1 for the on timely delivered. The challenge identified for investment in the delivery time, quantity or quality of farming inputs, such as seeds and fertilizers, machineries. This means that clients face uncertainty about their cost of production and profits from season to season, and if they are unable to save, they may have difficulty repaying loans when input prices are high(Innovations for Poverty Action, 2009). The suppliers of inputs delay in delivery causes for project failure and repayment problem.

Table 3.1: Expected Sign (+/-) of Explanatory Variables in this Study

Explanatory Variables	Definition	Expected Sign
Age	The older the age having high experience contributes a lot for loan repayment	+
Sex	lending to women, lead to high loan repayment rates	+
Marital status	Married borrowers can take great care than non married for default	-
Education	Being literate borrowers well informed and contributes for default negatively	-
Credit Experience	borrowers who have no or less experience, will contribute for default	+
Project Appraisal	appraising a loan Properly less probability being default	-
Due diligence	performing due diligence thoroughly less probability being default	-
Projects follow up	Performing fledged follow up as per the schedule the probability of defaulting is less	-
Sector	agricultural projects are seasonal, the rate for default so high	+
Form of disbursement	disbursement in kind contributes for default negatively	-
Time of Loan Disbursement	disburse the loan timely, less probability being default	-
Grace Period	large grace period is given for projects, less probability being default	-
Project implementation schedule	When projects run according to the schedule less probability being default	-
Project Profitability	The more the profitability of projects, the less the probability of being default.	-
Loan Amount	Increasing loan amount ,increasing capital , generates revenue, less probability being default	-
Supply	The suppliers of inputs delay in delivery ,probability being default	+

3.7. Model Specification

The simplest possible qualitative response regression model is the binary model in which the regressand is of the yes/no or presence/absence type. In the logit model, the dependent variable is the log of the odds ratio, which is a linear function of the regressors. The probability function that underlies the logit model is the logistic distribution (Gujarati, 2004, p. 624-625).

Although both logit and probit models on the same axis, logit model has heavier tails due to greater spread of the distribution curve. These situation causes that logit model is better than probit model in larger sample size. This is because when the sample sizes an increase, probability of observes in tail increases too (Cakmakyapan and Goktas, 2013).

According to Vasisht (n.d), logit analysis produces statically sound results, which can be easily interpreted, and the method is simple to analyses. Assume the following basic model, it can be express the probability that $y=1$ as a cumulative logistic distribution function.

$$Y_i = \beta_1 + \beta_2 X_i + \varepsilon_i$$

$$P_i = E\left(Y = 1/X_i\right) = \beta_1 + \beta_2 X_i$$

The cumulative Logistic distributive function can then be written as:

$$p_i = \frac{1}{1 + e^{-(\beta_1 + \beta_2 X_i)}} = \frac{e^{Z_i}}{1 + e^{Z_i}}$$

where, $Z_i = \beta_1 + \beta_2 X_i$

$P_i = \text{prob}(Y = 1 | X)$ is the response probability. The non-response probability $(1 - P_i)$ is also evaluated as:

$$1 - p_i = \text{prob}\left(Y_i = 0/X_i\right)$$

$$1 - P_i = 1 - \frac{e^{Z_i}}{1 + e^{Z_i}} = \frac{1}{1 + e^{Z_i}}$$

Note that the response and non- response probabilities both lie in the interval [0, 1]; Z_i ranges from $-\infty$ to $+\infty$, and hence, are interpretable. There is a problem with non-linearity in the previous expression, but this can be solved by creating the odds ratio $\frac{P_i}{1-P_i}$ and its log-transformation.

$$\frac{P_i}{1-P_i} = \frac{\text{prob}\left(Y_i = 1/X_i\right)}{\text{prob}\left(Y_i = 0/X_i\right)} = \frac{1+e^{Z_i}}{1+e^{-Z_i}} = e^{Z_i}$$

$$L_i = \ln\left(\frac{P_i}{1-P_i}\right) = Z_i = \beta_1 + \beta_2 X_i \quad (\text{Gujarati, 2004})$$

L_i is called the logit, thus, the log-odds is a linear function of the explanatory variables. The above transformation has certainly helped the popularity of the logit model. Note that for the linear probability model it is P_i that is assumed to be a linear function of the explanatory variables. The odds ratio can be interpreted as the probability of something happening to the Probability it will not happen. Accordingly, the estimated models used in this study presented as follow.

$$\begin{aligned} LOR = & \beta_1 + \beta_2(Age) + \beta_3(Sex) + \beta_4(MSta) + \beta_5(EduQB) + \beta_6(CExp) + \beta_7(Sec) + \\ & \beta_8(LoApp) + \beta_9(DueD) + \beta_{10}(PFol) + \beta_{11}(FDis) + \beta_{12}(TLoD) + \beta_{13}(GP) + \beta_{14}(PIS) \\ & + \beta_{15}(PPr of) + \beta_{16}(LOAM) + \beta_{17}(Sup) \end{aligned}$$

Where; LR, Age, Sex, MSta, EduQB, CExp, Sec, LoApp, DueD, PFol, FDis, TLoD, GP, PIS, PProf, LoAmt and Sup denoted for loan repayment, age, sex, marital status, educational qualification of borrower, credit experience, sector of the project, proper loan appraisal, due diligence, project follow up, form of disbursement, time of loan disbursements, grace period, project implementation schedule, project profitability, loan amount, input supply respectively.

β_1 = an intercept

$\beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}, \beta_{11}, \beta_{12}, \beta_{13}, \beta_{14}, \beta_{15}, \beta_{16}, \beta_{17}$ represent estimated coefficient

CHAPTER FOUR

RESULT AND DISCUSSION

This chapter talks about analysis of the result and discussion to achieve research objectives and lay down a base for conclusion. The first section of this chapter discusses the result of descriptive statistics of explanatory variables. Besides, the second section discusses the econometrics result of binary logistic & the analysis of significant variables, multi collinearity test and measures of goodness of fit.

4.1. Descriptive Statistics Result

This section presents the descriptive statistics of dependent and explanatory variables used in this study. The dependent variable used in this study is loan repayment while explanatory variables are age, sex, marital status, educational qualification, proper loan appraisal, form of disbursement, time of loan disbursement, grace period of the project ,credit experience of borrowers, sector, due diligence, project follow up, project implementation schedule, project profitability, loan amount, and supply of input.

Through descriptive statistics, the researcher used mean, percentage, standard deviation, and frequency distribution. In addition, Chi-square test statistics are employed to compare defaulter and non-defaulter group in terms of each explanatory variables. The borrowers who did not fail to repay their loan on repayment date are non-defaulters otherwise defaulters.

4.1.1. Borrowers Characteristics Vs Loan Repayment (Continuous)

Age is one of the independent variables related with borrower's characteristics and determined loan repayment performance of the borrowers. It is a continuous variable, hence from the total respondents(104)21.2% respondents were less than the age of 30 years, 51% respondents were 31-45 years old, 23.1 % respondents were from 46-60 years old, and 4.8% respondents were above 60 years old. From less than the age of 30 years, 54.5% were the non-defaulters and 45.5% were defaulters. In the age range of 31-45 years old 35.8% respondents were the non-defaulters and 64.2% were defaulters. From 46-60 years old 33.3 % respondents were the non-defaulters and 66.7% were defaulters,

and above 60 years old 80% respondents were the non-defaulters and 20% were defaulters as depicted in table 4.1. Thus, the non-defaulters placed in the age of above 60 years old. Because, older borrowers would be more responsible, experienced and disciplined in repaying their loans than younger borrowers. This result of non-defaulters the same as the results Mokhtar et al. (2012).

Table 4.1; Age of Borrowers and Loan Repayment

Variables	Category	Non- Defaulter		Defaulter		Total	
		N	%	N	%	N	%
Age of respondent	Less than 30 years	12	54.5%	10	45.5%	22	21.2%
	31-45 years old	19	35.8%	34	64.2%	53	51.0%
	46-60 years old	8	33.3%	16	66.7%	24	23.1%
	Above 60 years old	4	80.0%	1	20.0%	5	4.8%
Total		43		61		104	100%

Source; computed based on own survey, 2015. N=number of respondents

Table 4.2 disclosed that, 38.5%, 57.7%, and 3.8% respondents were single, married, and divorced respectively. The single respondents were accounts for non-default and default 35% and 65%. Married respondents were 48.3% and 51.7% non-defaulter and defaulter respectively. Among of Divorced respondents they were 100% defaulters. This indicated that divorced borrowers were the worst defaulters than single and married. The divorced borrows will not fell responsibility and their management capacity will be lower. This result of defaulters the same as the result of Josephat, et al. (2013).

Table 4.2; Marital Status of Borrowers and Loan Repayment

Variables	Category	Non- Defaulter		Defaulter		Total	
		N	%	N	%	N	%
Marital status of respondent	Single	14	35%	26	65%	40	38.5%
	Married	29	48.3%	31	51.7%	60	57.7%
	Divorced			4	100.0%	4	3.8%
Total		43		61		104	100%

Source; computed based on own survey, 2015. N= number of respondents

Table 4.3 revealed that, from the total respondents, 4.8%, 73.1% ,11.5 % and 10.6% respondents had no formal education, primary education(1-8), high school(9-12) and tertiary education (above grade 12) respectively. Among of the respondents who had no formal education, 40% were defaulters and 60% non-defaulters. In addition, among of the respondents who had primary education, 60.5% and 39.5% were defaulters and non-defaulters respectively. The respondents who had secondary educational level 58.3% and 41.7% were defaulters and non-defaulters respectively. More over those respondents who had tertiary education (above grade 12) level 54.5% and 45.5% were defaulters and non-defaulters respectively. Most of the borrowers placed in the primary education level at the same time they were defaulters. This result contradicts the result of Yacob (2014) that the clients with lower education have fewer financial options and thus they would improve on their loan repayment performance in order not to lose their only formal source of credit.

Table 4.3; Educational Qualification of Borrowers and Loan Repayment

Variables		Non - Default		Default		Total	
		N	%	N	%	N	%
Educational Qualification of Borrowers	No formal education	3	60%	2	40%	5	4.8%
	Primary education(1-8)	30	39.5%	46	60.5%	76	73.1%
	secondary education(9-12)	5	41.7%	7	58.3%	12	11.5%
	Tertiary education(> G.12)	5	45.5%	6	54.5%	11	10.6%
Total		43		61		104	100.0%

Source; computed based on own survey, 2015. N= number of respondents

4.1.2. Borrowers Characteristics Vs Loan Repayment (Dummy)

Besides percentage and frequency in dummy variables, the chi square test of independence allows the researcher to determine whether variables are independent of each other or whether there is a pattern of dependence between them. If there is dependence, the researcher can claim that the two variables have a statistical relationship

with each other. So, Pearson Chi-Square used in this study to indicate the level of association of the independent variables with loan repayment.

Table 4.4 revealed that, out of the total 104 sample respondents, 9.6% were female borrowers and the rest 90.4% were male borrowers. In view of that, 40% and 60 % of female borrowers were non-defaulters and defaulters respectively, whereas 41.5% and 58.5% male borrowers were non-defaulters and defaulters respectively. This reveals that from their respective sex composition, males' respondents had more repayment performance than female respondents were. Male generally delight in the hard work ethics and the culture of financial discipline. Sex composition of the borrowers insignificantly associated with loan repayment ($X^2=0.008$, $P=0.928$). This result the same as the results of Afolabi (2010) but in opposite direction to Bhatt and Tang (2002).

Out of 104 respondents, 53.8% had no long years credit experience but they have at least one year credit experience from DBE because the respondents randomly selected that at least their loan reached the first repayment , 46.2% % were have credit experience. In accordance with this, 30.4% and 69.6% of non-defaulter and defaulter borrowers had no credit experience respectively, whereas and 54.2% and 45.8% of non-defaulter and defaulter borrowers had credit experience respectively. Among of the respondents, those who had no long years of credit experience fail to pay their loan successfully. Verheul et al. (2007) confirmed that experience in the business operations able to amplify borrowers' problem solving ability including seizing opportunities that are important to the growth of the business and their repayment abilities. This variable also significantly associated with loan repayment at 5% of significance level($X^2=6.042$, $p=.014$) (table 4.4).

Table 4.4; Sex, credit experience of Borrowers and Loan Repayment

Variables	Category	Non-Defaulter		Defaulter		Total		Pearson Chi-Square
		N	%	N	%	N	%	
sex of respondent	Female	4	40%	6	60%	10	9.6%	X ² =0.008 P=0.928
	Male	39	41.5%	55	58.5%	94	90.4%	
Credit experience	No	17	30.4%	39	69.6%	56	53.8%	X ² =6.042 P=.014*
	Yes	26	54.2%	22	45.8%	48	46.2%	

Source; computed based on own survey, 2015. N= number of respondents

* Significant at 5%

4.1.3. Project Characteristics Vs Loan Repayment (Dummy)

Table 4.5 revealed that, from the total respondents,88.5% borrowers loan were agriculture & agricultural related, while 11.5% loan were service sector .The respondents involved in agriculture & agricultural related sector (commercial farming and processing) 60.9% and 39.1% were defaulters and non defaulters respectively. The rest 41.7% and 58.3% were defaulters and non-defaulters involved in service providing sector as shown on table 4.5. As the table depicted, the agriculture sector showed that the percentage of default higher than service. The result was the same as Besley and Coate (1995) .The Pearson Chi square revealed X²=1.614 and P=.204.

Table 4.5; sector and Loan Repayment

Variable	Loan Category	Non default		Defaulter		Total		Pearson Chi-Square
		N	%	N	%	N	%	
Sector	Agriculture & agriculture related	36	39.1%	56	60.9%	92	88.5%	X ² =1.614 P=.204
	Service	7	58.3%	5	41.7%	12	11.5%	

Source; computed based on own survey, 2015.N= Number of respondents

4.1.4. Bank Related Factors Vs Loan Repayment (Dummy)

Table 4.6 revealed that 57.7% of the respondents, their projects' were not appraised properly by the bank and the rest 42.3% respondents' projects were appraised properly. Amongst the respondents their loans were not appraised properly, accounts 88.3% and 11.7% defaulters and non-defaulters. In the other hand, the respondents' projects appraised properly, 18.2% and 81.8% were defaulters and non-defaulters .The number of defaulters increased when their projects were not appraised properly. The result supported by Alex Addae-Korankye (2014) in that the causes of loan default was poor appraisal. Proper project loan appraisal associated with loan repayment strongly and significantly at 1% significance level($X^2=51.513$, $p=.000$) (table 4.6).

During the interview, the managers and staffs of the bank told to the researcher that projects proper loan appraisal has a positive and significant effect on loan repayment. However, due to lack of time, labor and negligence, in this stage the projects financial, managerial, and technical and market situation has not analyzed detail. Therefore, it invites default loan.

The due diligence result showed that for 46.2% of the respondents the bank did not do careful customer selection (about customers general back ground, source of equity, previous credit status, etc), and for the rest of 53.8% thorough due diligence was done by the bank. The respondents' whose project due diligence was not done in a well manner were 68.8% and 31.2% defaulters and non- defaulters. In the other hand 50% of defaulters and non- defaulters careful due diligence were done by the bank. Thus defaulters increased when their projects due diligence were not done properly. The result supported by Alex Addae-Korankye(2014) in that the causes of loan default was improper client selection. Thorough due diligence has associated with loan repayment significantly at 10% significance level($X^2=3.747$, $p=.053$) see table 4.6.

At the time of interview, the interviewee underlined that due diligence has been done thoroughly but sometimes due to much more flow of customers and employees negligence the expected due diligence will not produced.

Table 4.6 also revealed that 83.7% of the respondents, the bank did not do fledged follow up for projects and for the rest 16.3% respondents' serious follow up was done by the bank. The respondents' whose project follow up was not done in a well manner accounts for default and non- default 64.4% and 35.6% respectively. In the other hand 29.4% and 70.6% of defaulters and non- defaulters respondents fledged follow up were done by the bank. The default rate is high for those projects no good follow. Continuous follow up of borrowers reminds them to pay attention toward their business and enables to increase their perception of responsibility toward loan repayment. Fledged follow up associated with loan repayment strongly and significantly at 1% significance level($X^2=7.166$, $p=.007$) see table 4.6. The result is the same as Yasir, et al. (2012) and Koopahi and Bakhshi (2002).

The managers and staffs of the bank agreed that good follow up has not gone as their plan due to lack of labor and a huge flow of customers from Gambella Regional State for new cotton loan. So, the officers most of their time engaged in receiving new applications and doing due diligence rather than performing follow up according to their action plan. Failing in follow up the consequence is directly failing in loan collection. They urged that to do follow up seriously to have good loan portfolios.

Table 4.6; Proper loan appraisal, due diligence, project follow up vs. Loan Repayment

Variables	Category	Non-Defaulter		Defaulter		Total		Pearson Chi-Square
		N	%	N	%	N	%	
loan Appraisal	No	7	11.7%	53	88.3%	60	57.7%	$X^2=51.513$ P=0.000***
	Yes	36	81.8%	8	18.2%	44	42.3%	
Due diligence	No	15	31.2%	33	68.8%	48	46.2%	$X^2=3.747$ P=.053**
	Yes	28	50%	28	50%	56	53.8%	
Fledged Project Follow Up	No	31	35.6%	56	64.4%	87	83.7%	$X^2=7.166$ P=.007***
	Yes	12	70.6%	5	29.4%	17	16.3%	

Source; computed based on own survey, 2015. N=number of respondents

** Significant at 10% ***significant at 1%

4.1.5. Loan utilization Vs Loan Repayment (Dummy)

Table 4.7 revealed that, 66.3% of the loan released in cash basis where as 33.7% projects' loan released in kind and both. Among of the sample respondents, the loan released in cash accounts for default and non-default 72.5 % and 27.5% respectively. Whereas the form of disbursement in kind & both the percentage of defaulters and non-defaulters counts 31.4 % and 68.6% respectively. Hence, disbursing /releasing the loan in cash contributing a lot for default. Because, disbursing in cash can lead to loan diversion in line with its liquidity nature. The result was the same as Abrham (2002).The form of loan disbursement associated with loan repayment strongly and significantly at 1% significance level($X^2=16.124$, $p=.000$) (table 4.7).

In case of time of loan disbursement, 51.9% of the loan not disbursed on time where as 48.1% of the loan disbursement was on time. From the respondents 57.4% & 42.6% were defaulters and non-defaulters when there were lag in disbursement while 60% & 40% were defaulters and non-defaulters respectively when the loan disbursed timely. Even if disbursement performed on time the percentage of defaulters increase. Whatever the case, disbursing the loan on time based on the activity contributes a lot for proper loan utilization.

Table 4.7; form of disbursement, time of loan disbursement vs. Loan Repayment

Variables	Category	Non-Defaulter		Defaulter		Total		Pearson Chi-Square
		N	%	N	%	N	%	
Form of disbursement	In Cash	19	27.5%	50	72.5%	69	66.3%	$X^2=16.124$ P=.000***
	In Kind and both	24	68.6%	11	31.4%	35	33.7%	
Time of disbursement	No	23	42.6%	31	57.4%	54	51.9%	$X^2=.072$ P=.789
	Yes	20	40%	30	60%	50	48.1%	

Source; computed based on own survey, 2015. N=number of respondents

***significant at 1%

4.1.6. Project implementation Vs Loan Repayment (Dummy)

The table (4.8) below depicted that 62.5% of the projects had no grace period and 37.5% of the projects had grace period. The projects had no grace period contributes for default and non-default loan was 80% and 20% respectively. In the other hand, projects had grace period contributes for default and non-default loan was 23.1% and 76.9% respectively. The table below demonstrates that when the projects have no grace period, projects faced repayment problem when the loan due later due to insufficient time for implementation. Grace period and loan repayment strongly and significantly associated at 1% significance level($X^2=.488$, $p=.000$) see table 5.8.

Regarding to the project implementation schedule, 57.7% of the respondents their projects were not implemented according to the schedule, where as 42.3% of projects accomplished their implementation according to the schedule. As it depicted in the table projects were not implemented according to the schedule contribute for default and non-default 73.3% & 26.7% respectively. In the other hand when the borrowers accomplished their activity according to the schedule, the percentage of default and non-default 38.6% & 61.4% respectively. The respondents who could not implement their projects on time were more defaulters. Project implementation schedule and loan repayment were strongly and significantly associated at 1% significance level($X^2=.488$, $p=.000$) see table 4.8.

Table 4.8; Grace period, Project implementation schedule vs Loan Repayment

Variables	Category	Non-Defaulter		Defaulter		Total		Pearson Chi-Square $X^2=32.568$ $P=.000***$
		N	%	N	%	N	%	
Grace Period	No	13	20%	52	80%	65	62.5%	$P=.000***$
	Yes	30	76.9%	9	23.1%	39	37.5%	
Project implementation schedule	No	16	26.7%	44	73.3%	60	57.7%	$X^2=12.601$ $P=.000***$
	Yes	27	61.4%	17	38.6%	44	42.3%	

Source; computed based on own survey, 2015. N=number of respondents

***significant at 1%

4.1.7. Financial situation Vs Loan Repayment (Dummy)

Table 4.9 revealed that, 39.4% of the projects scored net loss where as 60.6% got net profit. Among of the respondents that scored net loss, 63.4% were defaulter, and the remaining 36.6% were non-defaulters. The projects that scored net profit, 55.6 % were default and the remaining 44.4% were non-default. The table showed that projects that have net loss expected to repay the loan from the other source of finance otherwise the probability of loan to default. Even if most of the respondents answered that, they left it blank space but they responded, as there is the net profit /loss. Thus, the exact amount of profit / loss could not include, as a continuous variable for analysis .The respondents, who got profit from their loan, were high loan repayments rates. The result is the same as Stephen (2012); and Wongnaa and Awunyo (2013).

Table 4.9; profitability vs. Loan Repayment

Variables	Category	Non-Defaulter		Defaulter		Total		Pearson Chi-Square
		N	%	N	%	N	%	
project profitability	Net loss	15	36.6%	26	63.4%	41	39.4%	X ² =.633 P=.426
	Net profit	28	44.4%	35	55.6%	63	60.6%	

Source; computed based on own survey, 2015. N=Number of respondents

4.1.8. Loan amount Vs Loan Repayment (Continuous)

Loan amount is a continuous variable that expressed in terms of currency. For it the most proportionate amount of loan category as coded (0= 1million-5 million, 1=6 million to 10 million, 2=11million-15 million and 3=16million-25 million). Table (4.10) below showed that the mean of the loan amount taken was 1.37 i.e. the amount of loan taken by the respondent from the range 6 million to 10 million. The same table revealed that, 14.4% of customers their loan amount was 1-5 million, 40.4% got a loan amount 6-10 million, 39.4 % borrowers got loan amount 11-15 million, and 5.8% borrowers got loan amount of 16-25 million. The respondents who took loan amount from 1-5 million the percentage of defaulters and non-defaulters were 53.3% and 46.7% respectively. The respondents who

took loan amount from 6-10 million the percentage of defaulters and non-defaulters accounted for 66.7% and 33.3% respectively. In addition, the respondents who took loan amount from 11-15 million the percentage of defaulters and non-defaulters accounted for 56.1% and 43.9% respectively. In addition, the respondents took loan amount from 16-25 million the percentage of defaulters and non-defaulters accounted for 33.3% and 66.7% respectively. When the amount of loan increases, the probability of default decreased. It can be the fact that an increase in amount, borrowers can do their project in a wide range with the inclusion of quality and quantity of products. Therefore, their project can generate huge revenue and can repay the due amount of loan on time. This is the same as Ali AL-Sharafat, et al. (2013) that the volume of loans borrowed the most important factor and had a positive effect on the repayment performance of the investigated agency. This is also the same as (Ifeanyi and Blessing, 2012).

Table 4.10; Loan amount vs. Loan Repayment

	N	Minimum	Maximum	Mean	Std. Deviation
Loan amount taken	104	0	3	1.37	0.801

Variables		Non -Default		Default		Total	
		N	%	N	%	N	%
Loan amount taken	1-5 million	7	46.7%	8	53.3%	15	14.4%
	6-10 million	14	33.3%	28	66.7%	42	40.4%
	11-15 million	18	43.9%	23	56.1%	41	39.4%
	16-25 million	4	66.7%	2	33.3%	6	5.8%
Total		43		61		104	100.0%

Source; computed based on own survey, 2015. N=Number of respondents

4.1.9. External factors Vs Loan Repayment (Dummy)

Supply of inputs

From the total respondents 79.8% did not get the inputs from the suppliers but 20.2% did get the inputs at the right time. From the total respondents 65.1% were defaulters that did not get the inputs on time and the remaining 34.9% were non-defaulters. In the other hand, 33.3% were defaulters with right time supply of inputs but 66.7% non-defaulters. Therefore, the numbers of non-defaulters were high due to supply of inputs timely. This result supported by Koopahi and Bakhshi (2002) in that use of machinery had significant and positive effect on the agricultural credit repayment performance. Because, if there is the adequate and consistent supplies of inputs for projects, the producers / projects can implement their projects correctly and the products can have fair price. This variable was strongly associated with loan repayment at 1% level of significant ($X^2=6.956$, $P=.0080$).see table 4.11.

Table 4.11; supply of inputs vs. Loan Repayment

Variables	Category	Non-Defaulter		Defaulter		Total		Pearson Square	Chi-
		N	%	N	%	N	%		
supply of Input	No	29	34.9%	54	65.1%	83	79.8%	$X^2=6.956$ $P=.008^{***}$	
	Yes	14	66.7%	7	33.3%	21	20.2%		

Source; computed based on own survey, 2015. N=number of respondents,

***significant at 1%

4.2. Econometrics Result

Before running the logit model, the explanatory variables were checked using the following tests.

4.2.1. Multicollinearity Tests

The multicollinearity problem whether it is present or not could be tested its degree before running the model (Emmanuel, 2010).

In the construction of an econometric model, it may happen that two or more variables giving rise to the same piece of information are included, that is, we may have redundant information or unnecessarily included related variables. This is what we call a multicollinearity (MC) problem.

One of the assumptions of the CLRM is that there is no exact linear relationship exists between any of the explanatory variables. When this assumption is violated, we speak of perfect MC. If all explanatory variables are uncorrelated with each other, we speak of absence of MC. Multicollinearity usually exists in most applications. Therefore, the question is not whether it is present or not; it is a question of degree! In addition, MC is not a statistical problem; it is a data (sample) problem. Therefore, we do not “test for MC”; but measure its degree in any particular sample (using some rules of thumb).

Some of the methods of detecting MC are high R^2 . The R^2 shows that it is not as high as (70.62%). It confirms there is no multicollinearity problem instead, it indicates the model explained by the explanatory variables up to 70.39%, and it point out there are other variables that can best explain the regressand.

The other methods of detecting MC is Variance inflation factor (VIF) (Emmanuel, 2010). According to Emmanuel (2010), VIF can be calculated:

$$\text{VIF} (\beta_j) = \frac{1}{1-R_j^2}$$

Where R^2 is the coefficient of determination of the auxiliary regression.

If VIF (β_j) exceeds 10, then β_j is poorly estimated because of MC (or the j^{th} regressor variable (X_j) is responsible for MC). The VIF values for continuous variables were found to be very small (less than 2). This is to indicate the absence of multicollinearity between those variables (Appendix 3).

In addition to VIF, contingency coefficients were computed to check the existence of multicollinearity problem among the discrete explanatory variables. A contingency coefficient is a measure of the degree of relationship, association of dependence among variables included in the study. The contingency coefficient is calculated as follows (Garson, 2008 cited in Fikirte, 2011):

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

Where: C = contingency coefficients, X^2 = the value of Chi-square, N = total sample size. The decision rule for contingency coefficient is the larger the value of this coefficient, the greater the degree of association. The maximum value of the coefficient is never greater than 1.

The results of contingency coefficients reveal that there was no serious problem of association among the discrete variables (see appendix 4).

Therefore, four continuous and twelve discrete explanatory variables were used to estimate the logit model.

4.2.2. Measures of Goodness of Fit

The conventional measure of goodness of fit, R^2 , is not particularly meaningful in binary regressand models. A measure similar to R^2 , called pseudo R^2 , is available, and also ranges between 0 and 1 (Gujarati, 2004).

According to Kibrom (2010), the use of conventional R^2 for goodness of fit when the dependent variable takes either 1 or 0 is not appropriate. “A summary measure used similar to the conventional R^2 that have been suggested for models with qualitative dependent variable is pseudo R^2 . It should be noted, however, that in binary regressand models, goodness of fit is of secondary importance. What matters are the expected signs of the regression coefficients and their statistical and/or practical significance? As noted previously, a more meaningful interpretation is in terms of odds, which are obtained by taking the antilog of the various slope coefficients” (Gujarati, 2004, p .605-606). Thus for this study, the model pseudo R^2 is 77.05% or 0.77 (as it is depicted in the logistic regression). This result indicates that, the logit model explained about 77.05% of the variation and it lies in the [0, 1] interval.

4.2.3. Analysis on Explanatory Variables

As depicted in the table below (table 4.12), 16 explanatory variables were considered in the econometric model. Out of which six (6) variables were found to be significant on the

dependent variable. These were marital status of respondent, educational qualification of borrowers, time of loan disbursement, proper loan appraisal, form of disbursement (in cash, in kind and both,) and grace period of the project. The coefficients of these all-significant variables were negative. The negative coefficient indicates that the dependent variable was associated with the independent variables negatively.

In contrast, ten (10) variables were found insignificant on dependent variable namely age, sex of respondents, credit experience of borrowers, sector, due diligence, project follow up, project implementation schedule, project profitability, loan amount, and supply of input. From these insignificant variables loan amount, project implementation schedule, due diligence and age of respondents were having a positive sign. The remaining insignificant variables their coefficient was negative. Overall, the binary logistic model predicted factors contributing to 77.05% of Development Bank of Ethiopia, West Region loan repayment determinants. See the table below (4.12)

Table 4.12: Results of Binary Logistic Model on the determinants of loan repayment.

	B	S.E.	Sig.	Exp(B)
Age of respondent	.120	1.475	.935	1.127
Sex of the borrowers	-2.233	2.147	.298	.107
Marital Status of respondent	-3.286	1.804	.068**	.037
Educational qualification of respondent	-5.490	2.594	.034*	.004
Credit experience of borrowers	-.700	1.220	.566	.496
Sector	-3.066	2.433	.208	.047
Proper project loan appraisal	-6.116	2.777	.028*	.002
Due diligence	.316	1.276	.804	1.372
Project follow up	-4.155	2.926	.156	.016
Form of disbursement	-4.290	1.928	.026*	.014
Time of loan disbursement	-2.595	1.556	.095**	.075
Grace period of the project	-3.019	1.532	.049*	.049
Project implementation schedule	.623	1.528	.683	1.865
Project profitability	-1.209	1.396	.386	.299
Loan amount	.003	1.257	.998	1.003
Supply of input	-2.212	1.645	.179	.109
Constant	15.167	5.735	.008	3.8656

Source: SPSS version 16 survey result 2015, B=regression coefficient, Exp (B) = odds ratio, Sig. = significances, S.E = standard error, Pseudo $R^2 = 77.05\%$, -2Loglikelihood = 32.366, Logistic Regression Chi-square =108.68

*Significance at 5% ** significant at 10%

According to the binary logistic result, the significant variables were significant at different level of significance and discussed as below.

Marital Status of respondent; this explanatory variable was significant at 10% level of significance but correlated with default loan negatively as expected. The odd ratio of the econometric result indicates that borrowers who engaged in marriage can reduce the probability of being default by 0.037 times, other things remain constant (table 4.12). It can be the fact that borrowers who engaged in marriage can have financial management experience in their home. Thus, having such managing experience can be reflected in their loan utilization. This confirmed by Fikirte (2011) non-defaulters were significantly more likely to be married.

Educational qualification; this variable was also significantly and negatively influence loan repayment at 5% level of significance as expected. An increase in the level of education decreases the probability of being default by 0.004, *ceteris paribus*. This figure reveals that the borrowers whose educational level increased have the probability of decreasing the default rate by 0.4 percent than the borrowers who have lesser education level/ illiterates (table 4.12). This implies that borrowers that are more educated may have access to business information. Oladeebo & Oladeebo (2008) described that default rate decreased with education level of the borrower increased. However, the findings of Yacob (2014) described those clients with lower level of education, have fewer financial options and thus they would improve on their loan repayment performance in order not to lose their only formal source of credit.

Project loan appraisal; This variable was negative and significant association with the dependant variable as expected. It is significant at 5% significance level. If other variables held constant, proper project loan appraisal reduces the probability of being defaulter by 0.002 (table 4.12). This can be achieved when the loans department officers take a careful study of the applicants to ensure that appraising proper amount, flexible repayment schedule and activity based disbursement. The bank managers and staffs conformed this during the interview held. They said, “The bank has its own project appraisal team at the region level and the projects appraisal has been done based on the

commodity study. Each appraisal officer has the responsibility to appraise the standardized projects. The officers access to commodity study (a documented guideline for loan appraisal) with detail parameters, rates, coefficients and standards for each of the sectors. Thus, unless the appraisal officers unethically behaved, the proper appraisal produced. The proper appraisal encompasses project background (both the personal and project), proper investment cost determination, project implementation schedule, financial projection, SWOT analysis and conclusion & recommendation

This result shared the findings of Boldizzoni (2008) on that loan appraisal process plays a big role in assuring the lender of minimal circumstances on losing his/her money. Ahmad (1997) also found the causes of loan default were improper appraisal by credit officers. Sheila (2011) also concluded inadequate financial analysis is a cause of loan default.

Form of disbursement; This variable was negatively and significantly, association between form of loan disbursement and the dependant variable (loan repayment) as expected. It is significant predictor on loan repayment at 5% significance level. If other variables held constant, disbursement in kind reduces the probability of being default by 0.014 (table4.12). This negative relationship implies that loan default is high for loans released in cash directly to the borrower. Abreham (2002) confirmed this.

Time of loan disbursement; this variable was also significant at 10% level of significance but correlated with default loan negatively. This means that the loan disbursed on time results in lower probability of being default. Thus, the sign was as expected. The odd ratio of the econometric result indicates that disbursing the loan timely can reduce the probability of being default by 0.075 times, other things remain constant (table 4.12). Disbursing loans according to the scheduled time based on the nature of projects and activities have a great contribution for proper implementations of projects. When projects run in the safest way, the probability for loan repayment will be high. Shaik and Tolosa(2014) confirmed that timely disbursement of loan increases the borrowers' loan repayment probability.

Grace Period; this variable also was found to influence borrowers' loan repayment performance negatively and significantly at 5% significance level as expected. Keeping the other factors constant, having large grace period decreases the probability of being default by 0.049 (table 4.12). Because having long grace period projects will have sufficient time for implementation so that borrowers could properly utilize the loan for the intended purpose and to generate adequate income after it starts operation and can pay the loan. During the interview, the interviewees told me that the maximum grace period is 5 years. This finding is the same as Abreham (2002).

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

This chapter talks about the findings of the study. The first section of this chapter discusses the conclusions part briefly. The second section presents recommendation for the findings.

5.1. Conclusion

The variables, which have insignificant influence, were discussed in detail at the descriptive part rather than in the econometric model.

This study concluded that married borrowers were best loan repayment actors. It can be the fact that the borrowers who engaged in marriage can hold responsibility, will increase the social status and they can have an exposure for financial management experience in their home. Thus, having such managing experience and felling responsible can be reflected in their loan utilization.

The Educational qualification of borrowers also significantly and negatively influences loan repayment. The selection of educated borrowers decreases the probability of being default. This is the fact that the literates can easily grasp knowledge, information, capable to manage their business, adopt new technologies and workable strategy for their business than the illiterates.

Proper project loan appraisal was associated with the loan repayment negatively and significantly. It has a positive and significant effect on loan repayment since it assesses the projects financial, managerial, and technical and market situation in detail whether they are feasible or not. Thus proper loan appraisal contributes a lot for good loan repayment.

The form of disbursement was significant and negatively associated with loan repayment. When the bank disbursed loans in kind, the probability of being default decreases.

Time of loan disbursement was also another significant variable with default loan negatively. Thus, unless the bank faces strange problems, the risk of being default most probably decreases when disbursements performed on time. Therefore disbursing the loan on time, we can expect high loan repayment performance.

The other significant variable was grace period. This variable influence borrowers' loan repayment performance negatively and significantly. Giving Projects long grace period, the probability of default decrease since enough time will enhance projects to utilize their loan effectively, generate revenue, and then make loan repayment.

5.2. Recommendation

Even if the educated borrowers have better repayment performance inclusion of no or less educated borrowers with due care to have project manager, technical staff, and recruiting advisory body at the entry point for loan access seems better for good loan repayment.

Since proper loan appraisal was influential factor for the loan repayment, the bank has to appraise projects thoroughly and ethically on neutral state of mind for to have a sound project on the determination of investment cost, financial projection, incorporation of capable management & technical staffs and market & marketing strategies.

The mode of disbursement also if it is possible to be in kind rather than in cash since loan released for suppliers on behalf of the borrowers, the probability of diversion could be blocked, or the bank has to make serious follow up how the borrowers are utilizing the disbursed loan and adjusting for phase-by-phase disbursement.

The researcher also recommends timely disbursement of loan. Since projects are sensitive to season (production, market, and implementation) for these hold proper amount and disburse when the need arises. The other factor that the bank has to careful is grace period. Even though the loan manual of the bank states that the maximum grace

period is 5 years for different projects, the need for grace period differs from project to project. So, based on the nature of projects and the difficulties that the projects faced it is better to adjust the grace period instead of attach on 1 year for agricultural & service projects and three up to 5 years for manufacturing and industrial projects.

Finally, the researcher recommends other researchers to do by including the other regions & head office, and the determinants of other variables like loan repayment performance, outreach, using innovative features of the bank and the other variables.

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APPENDICES

Appendix-1

JIMMA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
ACCOUNTING AND FINANCE

Questionnaire to study Determinants of Loan Repayment: Case Study in Development Bank of Ethiopia, West Region

First thanks for your time and voluntariness to fill questionnaire for the purpose of academic research on Determinants of Loan repayment: Case Study in Development Bank of Ethiopia, West Region. Since your responses are crucial effect on the research result to be reliable, please try to reply carefully as per the intention of each question and be sure that your responses are keeping confidentially. Thus, be confident and fill the questions according to the instructions. You can choose more than one for each of the question.

1. BORROWER'S CHARACTERISTICS

- 1.1. Age : 0) less than 30 1) 31- 45 2) 46-60 3) above 60
 years old
- 1.2. Sex : 0) female 1) male
- 1.3. Marital Status: 0) single 1) married 2) divorced 3) widowed
- 1.4. Educational Qualification:
- 0. No formal education
 - 1 primary education (Grade 1-8)
 - 2 Secondary education(Grade 9-12)
 - 3 tertiary education and above (above grade 12)
- 1.5. Do you have long years of credit experience (loan) from any financial institutions before?
- 0)No 1) Yes

2. THE PROJECT

- 2.1.What is your project status? 1. Pass 2. Special mention 3. Substandard 4. Doubtful 5. loss

2.2.The sector of the business that you are involved is

- 0) Agriculture & agricultural related 1) Service

2.3.Has been the bank appraising the projects thoroughly for financing? 0) No 1) Yes

2.4.If your answer for question no. 2.3 is No, what are the observed deficiencies at the time of appraising the projects?

1. Appraising improper amount of loan
2. Rigid repayment schedule
3. Not activity based disbursement schedule
4. If any other identify_____

2.5.Do you believe that your project/s due diligence well done at the time of know your customer (KYC) assessment according to the bank's procedures and policies? 0) No 1) Yes

2.6.If your answer for question no. 2.5 is No, why was not done due diligence according to the bank's policy and procedures?

1. Having Insufficient time
2. Lack of proper man power
3. deficiency in credit policy
4. If any others (identify)_____

2.7.Do you believe that the bank has done project follow up for the financed project/s properly and timely? 0) No 1) Yes

2.8.If your answer for question 2.7 is No, why not doing the project follows up properly.

1. Having Insufficient time
2. Lack of proper man power
3. If any others (identify)_____

2.9.If your answer for question no. 2.7 is yes, what are the findings / results after doing fledged follow up by the bank?

1. Loan Collection
2. Good loan portfolios status
3. (identify)_____

3. LOAN UTILIZATION

- 3.1. How was the loan released (in cash or in kind) to the project? 0) in cash 1) in kind & both
- 3.2. Did you utilize the extended loan for the intended purpose? 0) No 1) Yes
- 3.3. If your answer to question no. 3.2 is No, what is your reason for loan diversion?
1. The loan released is not enough for the intended purpose
 2. It was your initial intention
 3. The project faced market problem.
 4. Others (please identify) _____
- 3.4. Did you get the loan at the right time? 0)No 1) Yes
- 3.5. If your answer to question no. 3.4 is No, what is the reason for delay?
1. Lengthy period the bank took in processing
 2. Failures to timely provide the necessary documents by you.
 3. Failure of you to timely fulfill the preconditions stipulated on the loan contract
 4. Delay in settlement of the previous loan
 5. Others (please identify) _____

4. PROJECT IMPLEMENTATION

- 4.1. Was the grace period given enough for the implementation of the project by the bank?
0) No 1) Yes
- 4.2. If your answer to Q. 4.1 is no, how long was the grace period given?(identify it in terms of year)
- 4.3. Was the project fully implemented according to the project implementation schedule?
0) No 1) Yes
- 4.4. If your answer to Q. 4.3 is No, what was the limitation factor/s to implement according to the project implementation schedule?
1. Financial problem
 2. Technical problem
 3. Failure to get machinery supply on time
 4. Others (identify) _____
- 4.5. If your answer to Q. 4.4 is 1, what was the reason for the problem?
1. inflation
 2. underestimation of the investment cost

3. failure to raise own contribution
 4. inadequate loan released
 5. others (identify) _____
- 4.6. Did you block cash up front at the requested time by the bank? 0) No 1) Yes
- 4.7. If your answer to Q. 4.6 is no, what was the reason behind not to block cash on time?
- 4.8. What were your sources of equity?
1. Return from other business 2. Sales of shares 3. Saving
 4. Family support, donation, lottery, & prize
 5. Others (identify) _____

5. FINANCIAL SITUATION

- 5.1. Do you have proper financial recording system?
- 0) No 1) Yes
- 5.2. How was your project profitability? 0) Net loss 1) Net profit
- 5.3. If your answer for Q. 5.2 net profit, how much was it for the year?
- 5.4. If your answer to Q. 5.2 is net loss, what is the source to repay your loan?
1. From other source of income
 2. From project income
 3. Both from other source of income & project income

6. LOAN AND LOAN REPAYMENT

- 6.1. How many times did you borrow from DBE? _____
- 6.2. Was the loan you took recently enough for the intended Purpose?
- 0) No 1) Yes
- 6.3. Did you get the requested amount of loan from the bank? 0) No 1) Yes
- 6.4. What was the amount of the loan you requested? _____
- 6.5. Have you ever failed in repaying your loan according to the repayment period?
- 0) No 1) Yes
- 6.6. If your answer to Q. 6.5 is No, what were the initiating factors to repay your loan according to the repayment schedule?
1. Knowing that to take another loan , the current loan should not be at a loss status
 2. To keep prestige (social status)

3. Not to lose the held collateral
 4. To fulfill the obligation of paying the loan as per the bank loan contractual agreement
 5. Others
(identify)_____
- 6.7. Is the repayment period enough?) 0) Enough 1) Not enough
- 6.8. If your answer to Q .6.7 is not enough, what is the (term of loan) repayment period of the loan that you take from Development Bank of Ethiopia, West region?
0) short 1) medium 2) long
- 6.9. How was the method of disbursement of the loan?
0) Suitable 1) not suitable
- 6.10. If your answer to Q. 6.9 is not suitable, what do you think is the suitable form of disbursement? _____
7. If your answer is not suitable, how you are solving the problem? _____

8. EXTERNAL FACTORS

- 8.1. Have you delivered the produced goods / services to the target market? 0) No
1) Yes
- 8.2. If your answer to Q. 8.1. No, what are the challenges you were facing to sell your products?
1) fluctuating in price of goods /services
2) insufficient market channel
3) very large number of competitors
4) others(identify) _____
- 8.3. Have you faced uncontrollable constraints to your project? 0) No 1) Yes
- 8.4. If your answer for Q .8.3 is yes, which of the following constraints your project faced.
1. Unpredictable weather condition for agricultural projects
2. natural disasters (like flood, insect, frost, etc)
3. Change in government policy
4. Inadequate insurance coverage
5. others(identify) _____

8.5. If your project faced uncontrollable constraints, which was the impact on your loan repayment?

1. Failure to repay the due loan at maturity

2. Loss of collateral

3. Others(identify)_____

8.6. If your answer for Q .8.5 is 1, what a measure was taken by the bank to solve the problem?

1. Injection of additional loan

2. Loan rescheduling

3. Loan rehabilitating

4. If any other (identify)_____

8.7. Did the suppliers of inputs & machineries commit to deliver according to their contractual agreement? 0) No 1) Yes

8.8. If your answer for Q .8.8 is No, which of the following effects came to the project?

1. Project implementation delay

2. Input & machinery cost escalation beyond estimation

3. Problem on disbursement

If any (identify) _____

Appendix-2

Interview Questions

First thanks for your time and voluntariness to be interviewed for the purpose of academic research on **Determinants of loan repayment: a Case Study in Development Bank of Ethiopia, West Region**. Since your responses are crucial effect on the research result to be reliable, I am sure that you try to respond carefully as per the intention of each interview questions and be sure that your responses are keeping confidentially.

INTYREVIEW QUESTIONS TO BANK STAFFS & OFFICIALS

1. What seems like the loan appraisal process to produce the proper, reliable, and adequate loan appraisal proposal?
2. Do you believe that the bank has done due diligence to get credit worthy customers for their loan application? What are the limitations seen during the due diligence assessment?
3. Do you believe that the bank has done fledged follow up for its customers /loan? What are the results after project follow up?
4. How do you explain the impact of due diligence, loan appraisal, and project follow up with loan repayment?
5. What are the crucial confronting factors for loan repayment in the region?
6. What alternative measures were taken on the side of the bank to improve the repayment Situation?
7. Were the measures taken brought an improvement in repayment status of the project?

Appendix-3

Appendix 3: Variance Inflation Factor (VIF) of the continuous explanatory variables

Continuous Variables	R ²	Variance Inflation Factor(VIF)
Age of respondent	0.0019	1.0019
Education qualification of borrowers	0.2922	1.4128
Marital status of respondent	0.0227	1.0232
Loan amount taken	0.0101	1.0102

Appendix -4

Appendix 4: Contingency Coefficient for dummy explanatory variables

	Sex	Credit Experience	Sector	Loan appraisal	Due diligence	Project follow up	Loan release d(type)	Time of loan disbursement	Grace period	Project implementation schedule	Profitability	Supply of input
Sex	1	.008	.028	.004	.003	.003	.011	.026	.001	.001	0	.026
Credit Experience		1	.014	.020	.006	.005	.022	.014	.003	.006	.007	.003
Sector			1	.011	.003	.020	.020	.007	.003	.011	.007	.004
Loan appraisal				1	.016	.009	.026	.011	.041	.034	.009	.014
Due diligence					1	.014	.016	.003	.007	.042	.040	.120
Project follow up						1	.006	.004	.018	.014	.003	.009
Loan released(type)							1	.011	.011	.004	.007	.014
Time of loan disbursement								1	.006	0	.006	0
Grace period									1	.020	.009	.003
Project implementation schedule										1	.032	.014
Profitability											1	.006
Supply of input												1

Survey Result, 2015