FACTORS AFFECTING LOAN REPAYMENT PERFORMANCES:

A CASE STUDY IN DEVELOPMENT BANK OF ETHIOPIA, JIMMA DISTRICT

A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF JIMMA UNIVERSITY FOR A PARTIAL FULFILLMENT OF REQUIREMENTS FOR AWARD OF MASTER DEGREE IN BUSINESS ADMINISTRATION.

BY:

NAOL SHIFERAW GERBA

JIMMA UNIVERSITY

COLLEGE OF BUSINESS & ECONOMICS

MBA PROGRAM

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STATEMENT OF CERTIFICATE

This is to certify that the thesis titled "Factors affecting Loan Repayment Performance: A Case Study on Development Bank of Ethiopia, Jimma District", submitted to Jimma University, College of Business and Economics, Department of Management for the award of Degree of Master of Business Administration (MBA) and is a record of genuine research work carried out by Naol Shiferaw, under our guidance and supervision.

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

Main advisors name   Signature   Date

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Co-advisor name   Signature   Date

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DECLARATION

I hereby declare that this research thesis entitled "Factors affecting Loan Repayment Performance: A Case Study on Development Bank of Ethiopia, Jimma District", has been carried out by me under the guidance and supervision of Mr. Tadele Tesfaye(Assistant professor) and Mrs. Amina Ahmed (Msc).

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

Declared by   signature   Date

Naol Shiferaw Gerba   ------------------------   -------------------------

Abstract

This study was conducted in Development Bank of Ethiopia Jimma District geographical area. Development bank of Ethiopia is state owned and specialized financial institution with the mandate of providing long, medium and short term loans to feasible and viable projects of commercial agriculture, agro processing and manufacturing sectors following government priority area. This study is conducted on the factors affecting loan repayment; a Case study of Development Bank of Ethiopia, Jimma District. Accordingly, endeavors are made to contribute to the empirical gab regarding factors affecting loan repayment performances specifically in Jimma District. The main objective of this study was to identify and analyze the major factors of loan repayment performances in DBE, Jimma District; more specifically from four different perspectives, borrowers related factors, bank related factors, business/project related factors and factors related to external environments. Both primary and secondary data were used in the study. The primary data was collected from 150 selected borrowers through questionnaires and pre-tested structured interview with staffs and bank managers. To define and select the population of the study, stratified random sampling was used where borrowers were stratified based on their loan status. Both descriptive statistics and econometric analyses particularly logistic regression (binary logit) were employed to present the results and findings of the research. The study was basically conducted from four broad perspectives; factors related to characteristics of borrowers, factors in the side of lender institution, factors related to business/project and the other external factors were analyzed through descriptive statistics such as frequencies, percentages, mean, and standard deviation. A total of twenty one explanatory variables were included in the logistic regression and out of these eight were found to be statistically significant to influence the dependent variables. The results of binary logistic regression revealed that Educational qualification of borrowers, family size of borrowers, credit experience, having other business, proper follow up, duration of service time/time horizon, loan size and loan diversion were found significant and influenced loan repayment performances. Based on the descriptive and econometric results/analysis, the researcher has recommended to the bank to undertake proper screening, disbursing loan at the right time, conduct proper follow-up, provide sufficient amount of loan as per the feasibility study of the project, solve other difficulties as identified in this study and work on all other factors affecting loan repayment performances.

Key words: Bank, borrower, Loan Repayment.

ACKNOWLEDGEMENTS

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ACRONYMS/ABRIVATIONS:

ADLI…………………………………………Agricultural Development Led to Industry

BSC………………………………………..Business Scored Cared

CBE………………………………………..Commercial Bank of Ethiopia

DBE………………………………………..Development Bank of Ethiopia

ECG …………………………………………… Export Credit Guarantee

GDP ………………………………………… Growth Domestic Production

GTP ……………………………………………Growth and Transformation Plan

KYC………………………………………..Know Your Customer

LAT………………………………………...Loan Approval Team

MFI………………………………………..Micro-finance Institution

MOFED…………………………………………Ministry of Finance and Economy Development

NBE………………………………………..National Bank of Ethiopia

NPL………………………………………...Non Performing Loan

PCFR……………………………………….Project Completion Follow up Report

PIFR………………………………………...Project Implementation Follow up Report

POFR……………………………………….Project Operational Follow up Report

PRLR……………………………………….Project Rehabilitation and Loan Recovery

RUFIP ……………………………………….. Rural Financial Intermediation Program

SME ………………………………………......Small and medium Enterprises

SWOT……………………………………….Strength, Weakness, Opportunity and Threat

RRR………………………………………....Relative Risk Reference

VIF……………………………………….…..Variance Inflation Factor

WTO………………………………………......World Trade Organization

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Over the past two decades, the Ethiopian economy has gone through numerous changes; it substantially outperformed the average of Sub-Saharan African countries. The Government of Ethiopia adopted market oriented economic policy, made agriculture its primary priority in 1991, and implemented Agricultural Development Led-Industrialization (ADLI) strategy. Following the change of the government by 1991 the country introduced major economic reforms by accepting capitalist ideology contrary to the previous communist set up in the economy of the country by 1992(MoFD, 2015)

Since then, the Ethiopian economy has gone through remarkable economic growth in all agriculture, service and industrial sector according to the World Bank report of 2016(World Bank, 2016). Although initially led by agriculture, the growth base is broadening, with increasing contributions to GDP from services and industry year after years. In the same token the banking sector reveals dramatic progresses and expansions in the past twenty years. Banks play a very important role in the economic development of every nation. They have control over a large part of the supply of money circulation. Banks are the main stimulus of the economic progress of a country. The financial sectors contribution to growth lies in the central role it plays in mobilizing savings and allocating these resources efficiently to the most productive uses and investments in the sector Tihitina, 2009)

The Ethiopian financial institutions have a long time history. The use of money and coins in Ethiopia has a long history, and the introduction of modern banking is nearly a century old. The original bank of Abyssinia started operation in February 1905 and its activities included keeping government accounts and financing exports. Despite the long history, which precedes the advent of modern banking throughout most of Africa, the Ethiopian financial sector has not progressed as it beginning. In the period of a shift from a mixed to a state managed economy, the development of the financial sector was stunted. Although the financial sector of Ethiopia has grown in the 1990's, compared to its state during the preceding decades, it is still in its infancy.

In Ethiopia, there are two government owned banks and sixteen private banks, seventeen insurance companies (1 public and 16 private), thirty five (35) Micro finance institutions and five Capital Goods Finance Companies in 2015/16. Commercial Bank of Ethiopia (CBE) is one of the dominating state-owned banks whose assets represent about 70% of the sector and Development Bank of Ethiopia (DBE) is the only development bank having a second place market position in the country (National bank report, 2016).

Development bank of Ethiopia (DBE) is the only bank of its kind in Ethiopia. It's different from other commercial banks in its nature and objectives endowed to it. Development Bank of Ethiopia is a specialized financial institution established to finance and provide close technical support to viable projects from the priority areas by mobilizing fund from domestic and foreign sources while ensuring its sustainability. The Bank extends investment credit to creditworthy borrowers and projects that have received a thorough appraisal and found to be financially and economical viable and socially desirable. In addition to project financing and rendering technical support to the selected priority area sectors, DBE has given great task in financing the Small and Medium Enterprises through Lease Financing program to enable them to acquire capital goods and machineries (DBE annual report, 2015).

In 2015/16 fiscal year the Bank has set a target of approving, disbursing and collecting Birr 14.82 Billion, Birr 13.54 Billion and Birr 5.78 Billion respectively. With regard to the actual performance of the year; the approval, disbursement, and collection of Birr 11.8 Billion (80%), Birr 6.3 Billion (47%) and Birr 4.1 Billion (71%) were registered, respectively (DBE, annual report 2016)

The Non-performing loan size and ratio of the Bank in the year 2015/16 was Birr 5.6 Billion (17.71%) which is 53% of the planned target of Birr 3.6 Billion (9.45%) at the corporate level. Compared to the preceding year same period performance of 12.5%, it has increased by 44%.

The repayment performances of DBE Jimma district within the past three consecutive years showed that the bank's NPL is increasing and going against the plan to minimize the ratio into a single digit and achieve a 100% performing loans by 2020. Even though, NPL ratio of the bank showed little improvement from its historical performance at corporate level the NPL ratio of DBE in the year 2015/16 is 17.71% and fresh entrants to NPLs has showed sharp increment during 2015/16 fiscal year. The 2013/14 annual report of the bank indicates, DBE Jimma district NPL ratio is 14.35% while the corporate NPL ratio is 8.23%, with the fresh entrant to NPL 2.58%. Similarly, the 2014/15 annual report of the bank revealed that the NPL ratio of DBE is 12.54%, while NPL ratio in DBE Jimma district is 18.1%. The main reasons contributing for such

low performances particularly in NPL and fresh entrants to NPL related to different factors. According to Nawai & Sharif (2013), Olomola (1998) and Micha'el (2006), Abraham (2002) and kibrom (2004) and many other studies discussed in empirical studies in chapter two of this study, the main causes of such low repayment and high NPL ratio performance would emanate from institutions related factors, borrower related factors, business related factors and external factors. Hence, assessing and seeking for solution of factors affecting loan repayment performances become imperative in providing credit service for different governmental and non-governmental business.

1.2 Statements of the Problems

Development Bank of Ethiopia (DBE) is one of the major state owned institution established to support the economy development of the country through provision of project finance and technical support to viable projects that are selected as priority areas by the government. As a policy Bank, it is entrusted to serve as a tool for the country's development through availing medium and long term credit to agriculture, industry, mining and energy and SMEs (DBE annual plan, 2016).

Development Bank of Ethiopia is well known and specialized in project financing. The Bank has been offering medium and long term loans to different kinds of viable projects. Hence, it is known that the role of Development Bank of Ethiopia is very important in the economy practically by financing government development priority areas which are believed to be the engine of growth like Manufacturing Industry, Agro-Processing, Commercial Agriculture, Mining & Energy and SMEs. In addition to project financing, following the especial emphasis given by the government to Small and Medium Enterprises as they are believed to be the foundation for the move to industrialization, recently DBE is entrusted to support SMEs along with medium and large scale industrial projects.

Coming to the plan and performances of the bank, In 2015/16 fiscal year the Bank has set a target of approving, disbursing and collecting Birr 14.82 Billion, Birr 13.54 Billion and Birr 5.78 Billion respectively. Whereas the actual performance of the year; the approval, disbursement, and collection of Birr 11.8 Billion (80%), Birr 6.3 Billion (47%) and Birr 4.1 Billion (71%) were registered, respectively. In the geographical area where this research was conducted, Jimma District the case seems little different due to the fact that Financing agricultural projects especially in Gambella District was suspended in the year 2015/16, following the reportedly land overlapping and other related problems in the area and the very nature of projects in the

District(which is primarily agriculture). Hence, the performance of the District was highly affected not only in loan collection/repayment performances but in all aspects.

At corporate level the NPL ratio of the bank shows improvement from its historical performance which is 17.71% and fresh entrants to NPLs has showed increment during last 2015/16 fiscal year. At Jimma District the NPL ratio increased from 12.5% in the year 2014/15 to 18% in 2015/16 and the new entrant sharply increased from 1.65 to 2.5 in the same fiscal year.(Annual reports of DBE, 2014/15 and 2015/16 and national Bank of Ethiopia)

DBE has set a vision of having 100% successful projects by the end of the year 2020. The performance reports of the bank, which includes the figures in the above paragraph from the year 2015/16 however didn't shows the same story, but even though the time table keeps running the NPL ratio was not reducing from time to time as expected. Furthermore, the GTPI performance reports of the bank and the reports of National Bank of Ethiopia and the supervising governmental agency, Public Financial Enterprises Agency indicated that Development bank of Ethiopia was not achieving its targeted goal especially in approving, disbursing and collecting loans as expected from the plan cascaded from GTPI. The performance in Jimma District resembles the corporate performances of the bank and even worst in loan repayment performances.

In this study, focus is given to loan repayment performances which include both performances and nonperformance of loans. The reasons and factors for performances of loans or increase in NPLs are related to the cumulative effects of different factors. This is what necessitated and motivated the researcher to focus in this area. The issue of Loan repayment performance and NPL has been a subject of major concern for researchers for many years across the world and in recent years in Ethiopia.

In Ethiopia, there were researches conducted on the related topics by different researchers. For instance, Wondimagn (2012) conducted a research titled 'determinants of NPLs on commercial banks of Ethiopia' and his study indicated that interest rate has no significant impact on the level of commercial banks loan delinquencies in Ethiopia. On the other hand, Mitiku (2014) "Determinants of Commercial Banks Lending" with the objective of assessing the relationship between commercial bank lending and its determinants variables (bank size, credit risk, GDP, investment, deposit, interest rate, liquidity ratio and cash required reserve) by taking financial statement of seven years and found that there was significant relationship between loan size, credit risk, gross domestic product and liquidity ratio and commercial bank lending. Kibrom T (2010) studied about determinants of successful loan repayment performances of private borrowers

in the North Region of Development Bank of Ethiopia by using binomial model and focused on borrowers' specific and business type specific in order to analyze successful loan repayments.

Firafis Haile(2015) conducted a study on related subject area under a title 'determinants of loan repayment performances; a case study of Harari Microfinance institutions' mainly focusing on borrowers specific factors using binary logit model. The result identified loan size, credit experience, training, business type and family size were significantly affected the repayment performances. Similarly, Abraham G (2002) conducted a study on DBE Batu branch on loan repayment and its determinants in small scale enterprises financing in Ethiopia. The study mainly focuses on bank specific and borrowers' specific factors.

Arega Seyoum et, al. (2016) studied about factors affecting non-performing loans in the DBE central District by using descriptive statistics from bank specific factors and borrowers specific factors in order to determine factors affecting non-performing loans in the DBE central District. The result of the study shows that poor credit assessment and credit monitoring are the major causes for the occurrence of NPL in DBE. Credit size (includes aggressive lending, compromised integrity in approval, rapid credit growth and bank's great risk appetite); high interest rate, poorly negotiated credit terms and lenient/lax credit terms, and elongated process of loan approval were bank specific causes for the occurrence of nonperforming loans.

In all the above studies what affects loan repayment performances are evaluated from bank specific and borrowers' specific factors. In reality what affects loan repayment performances were not limited to bank specific factors and borrowers specific factors but beyond these it includes bank specific, borrower specific, business specific and other factors (macroeconomic factors). There were studies conducted on Nonperforming loans in Development Bank of Ethiopia in other area of the bank like in North region or Central region and Batu Branch but it's not appropriate to generalize the findings of these studies especially to Jimma District. Because, loans in the areas were mainly agricultural and the nature & types of problems differs from the central and north Districts which are predominantly industry, service and agro processing projects. In addition, there are internal and external changes since these researches were conducted in the bank, including Changes of policies, organizational restructuring, change in interest rate and the global climate changes are among the major occurrences.

Generally the researcher believes that the problems related to defining factors affecting loan repayment performances were not properly addressed particularly in Development Bank of Ethiopia Jimma District due to the fact that there were few empirical studies in this area and some previous studies conducted in other

areas of the bank were limited to bank specific and borrowers' specific factors. Hence the researcher is motivated to study and lay his own contribution on the factors affecting loan repayment performances in a broader sense. Accordingly, endeavors are made to identify the major factors that contributed to loan repayment performances specifically in DBE Jimma District from four broad perspectives, borrowers related factors, bank specific factors, business characteristics and external factors.

1.3. Objectives of the Study

1.3.1. General Objective

The objective of this study is to identify Factors affecting loan repayment performance, identify the major factors from four different perspectives particularly, from borrower side, from bank/lender side, from business and from other external side of loans of Development Bank of Ethiopia Jimma District.

1.3.1.1. Specific Objective

To achieve the general objective, the following more specific objectives were identified under this study:

1. Identify the major borrowers specific factors (Education, Experience…..etc.) on loan repayment performance of Development Bank of Ethiopia, Jimma District.

2. Identify the Bank specific factors (Loan size, Follow up, grace period, due diligence/KYC), Collateral and equity) on loan repayment performance of Development Bank of Ethiopia, Jimma District.
3. Identify Business related factors (Business sector, business form…etc.) on loan repayment performance of Development Bank of Ethiopia, Jimma District.
4. Identify other major factors (market and weather conditions) on loan repayment performance of Development Bank of Ethiopia, Jimma District.

1.4 Research Hypothesis

To achieve the objective of this study the researcher would test the following hypotheses concerning the factor affecting loan repayment performance of DBE, Jimma District. Empirical researches conducted in the area found different results; for instance Kibirom (2010), in his study on determinants of successful loan repayment Performance of private borrowers in Development bank of Ethiopia north region, identified factors that determine loan repayment performance which includes; borrowers perceived need, that is borrowers have to be given an opportunity to borrow for their perceived needs, competence, that is the

borrowers past personal and profit record, past prosperity etc. 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 family 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.

Awunyo-Vitor (2012) searched the determinants of loan repayment default among farmers in Brong Ahafo District 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 District 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 size and longer repayment period as well as access to training are more likely to reduce loan repayment default.

Abraham (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.

Firafis Haile(2015) conducted a study on related subject area under a title 'determinants of loan repayment performances; a case study of Harari Microfinance institutions' mainly focusing on borrowers specific factors using binary logit model. The result identified loan size, credit experience, training, business type and family size were significantly affected the repayment performances.

Based on these and other empirical research findings the researcher wants to draw the following research hypothesis;

H1: There is positive relationship between Borrowers' specific factors (Education and Experience) and loan repayment performance.

H2: There is positive relationship between Bank specific factors (Loan size, Follow up) and loan repayment performance.

H3: There is negative relationship between Business specific/project related factors (business sector and loan diversion) &loan repayment performance.

H4: There is positive relationship between macroeconomic factors) like market and weather conditions and loan repayment performance.

1.5 Significance of the Study

This study and its finding is significant for many more reasons. The subject of the study remains problems of every financial institution in our country this day. So, the findings of this research are expected to contribute a lot for different stakeholders. The following are among the main significance of this study: it benefits the researcher to obtain new knowledge about problems under the study and gives clear picture about the issue of loan repayment performance, Present the current clear picture of NPLs in DBE Jimma District and tries to show the significant factors (internal as well as external) that determine the repayment performances, Use as starting point for other studies which may focus on similar topics and issues related to factor affecting loan repayment performance in general and factors that influence the level of nonperforming loan in baking industry in particular and also study will enable lenders of Development bank of Ethiopia how to overcome potential factors that are highly affects the level of nonperforming loan in the bank at general.

1.6 Scope of the Study

This study is conducted on Development bank of Ethiopia Jimma District under a title factors affecting loan repayment performances. Hence the scope of the study is limited to the geographical limitation of Jimma District which includes Jimma branch, Gambella branch, Mettu branch, Bedelle branch, Agaro branch, Bonga branch, MizanTefari and Teppi branches. Jimma District is selected for geographical proximity and accessibility for data collection. Among eight branches under Jimma District, only two of them are graded as A branch (Jimma branch and Gambella branches) and its these two branches that are empowered to handle active customers and provide loan for their customers for practical purposes. Hence, the data used under this study is data from these two branches.

On the other hands, the subject matter of the study is limited to identifying major factors affecting loan repayment performances in the Jimma District. This study mainly focuses on the issues that extracted in the research objective and research hypothesis.

The other important issue is regarding kind and type of data used in the study. The study used both primary data collected using questionnaire and interviews and secondary data from different source as defined in methodology but such secondary data used in this study is limited to the past fiscal year, 2015/16, which is one year only.

1.7 Limitation of the Study

In conducting this study, the researcher faced some challenges and shortages from methodological limitations. The main problem is geographical limitation of the study in to Jimma district. The other limitation related to the theoretical drawbacks emanated from the nature of the models used in this study which is beyond the control of the researcher. The other limitation is regarding lists of independent variables; the independent variables are not limited to those listed, discussed and presented in this work but many more are not covered due to financial and time limitations.

1.8 Organization of the Study

This research report is organized in five chapters. Chapter one provides the general introduction about the whole report. Chapter two presents the review of related literatures. Chapter three provide detail description of the methodology employed by the researcher. Chapter four contains data analysis presentation and interpretation. Finally, the last chapter concludes the total work of the research and gives relevant recommendations based on the findings.

CHAPTER TWO:

REVIEW OF RELATED LITERATURE

This chapter presents the theoretical foundation of the study critically with issues pertaining to factors affecting the repayment performances of loans. A critical review of the existing literatures concerning the repayment performances of borrowers and factors which influences the repayment capacity, and Various literatures focusing both on non-performing loans and successfully performing loans are thoroughly reviewed and presented in this part of the study. Accordingly, first there is the theoretical reviews on well performing and non-performing loans which include nature and definition of NPLs, Classifications of Loans and advances, theories on bank loan and cause for loan default and performing loans. The other important part is reviewing different empirical results regarding the impact of various banks specific, borrowers' specific and macro level factors on the growth of nonperforming loan.

2.1. Theoretical Review

2.1.1. Banks and Its Importance

The term bank refers to an institution that deals with money and provides other financial services. According to Heffernan (1996), banks are defined as intermediaries between depositors and borrowers in an economy that are distinguished from other types of financial firms by deposit collection and offering loan products. Banks role in the economy of any country is very significant. They play intermediation function in that they collect money from those who have excess and lend it to others who need it for their investment.

Banks mobilize deposits and allocate the mobilized money efficiently to the most productive uses of investment in the real sector. Availing credit to borrowers is one means by which banks contribute to the growth of economies. The banking sector makes a meaningful contribution to the economic growth of every country. Banks contribution to the growth lies in the role they play in mobilizing deposits and allocating the resources efficiently to the most productive uses investment in the real sector. So making credit available to borrowers is one means by which banks contribute to the growth of economies. Banks pool resources together for projects that are too large for individual shareholders to undertake (Bagehot, 1873). They are also considered the most important enabler of financial transactions in any country's economy and are the

principal source of credit (Rose, 2002). Bank finance is the primary source of debt funding. Commercial banks extend credit to different types of borrowers for many diverse purposes, either for personal, business or corporate clients (Saunders & Cornett, 2003). Besides, banks are also the custodians of nation's money, which are accepted in the form of deposits and paid out on the client's instructions (Sinkey, 2002; Harris, 2003). 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).

Notwithstanding all other activities, banking industry considers lending as their most important function for utilization of funds. Since the major portion of gross profit of the industry is earned from loans, the administration of loan portfolios seriously affects the profitability of banks.

The most important financial institutions are commercial banks, mutual funds, security firms, insurance companies, and pension funds.

2.1.2. Development Banks

A development bank is a 'bank' established for the purpose of 'financing development'. A traditional definition of a development bank is one which is a national or District financial institution designed to provide medium-and long-term capital for productive investment, often accompanied by technical assistance, in less-developed areas (Encyclopedia Britannica, 2003). Development Banks are financial intermediation that provides financing to high priority investment projects in a developing economy. This definition implies that the purpose of development banking is to bring the country to a higher level of development. Development banks fill a gap left by undeveloped capital markets and the reluctance of commercial banks to offer long-term financing.

2.1.3. The Difference between a Development Bank and Commercial Banks

There are several differentiating factors between a development bank and a commercial bank. Some extreme observations below are made in order to emphasize "traditional" differences between the two in order to emphasize the point. Actual practice, of course, differs from commercial bank to commercial bank and from development bank to development bank. As the country's capital markets develop, there shall be less difference between these specialized institutions and the similarities shall become more apparent. With this as a premise, the traditional differences between development and commercial banks are in the following areas (compiled by Asian Development Bank, ADFIAP, 2007)

a. Impetus for the Creation of the Institution: A development bank is created as an instrument of economic development while a commercial bank is created by business opportunities.

b. Posture Relative to Business Opportunities: A development bank is supposed to be *pro-active* as it should take an active role to promote projects and to develop institutions (entrepreneurs). The projects chosen are those that are consistent with the economic development priorities. A commercial bank is known to be *reactive* to business opportunities. It requires bankability only after the entrepreneur's decision has been made; it waits for the idea to culminate into a funding requirement.

c. Types of Projects Supported: For a development bank, there is an explicit effort to support economic development projects. The following desired 'impact' projects form the basis for scanning for opportunities: import substitution (at competitive prices); exports; increased local demand; District development (for example, tourism); and increased industrial efficiency through better technology. For a commercial bank, the abovementioned goals are not the starting point for the identification of projects. Rather, they would most likely be side-benefits. A commercial bank has little concern for these objectives, except for the viability of the bank transaction. In short, a development bank's activities are project-based while that of the commercial bank are transaction-based.

d. Search Process for Projects Financed: A development bank goes into a planning cycle, identifying which are the likely areas to go into. For example, if it determines that an export is an area to be promoted, then it conducts a marketing study and seeks entrepreneurs to implement related projects. For the commercial bank, the search process is different. It asks, "Are you an exporter?", and then looks at that entrepreneur's cash balance to determine if there is a marketing opportunity for the transaction.

e. Project Promotion Activities: A development bank offers counseling and advisory services for enterprise development and promotion as part of its development lending process. A commercial bank offers legal and business advice, appraisal services and credit investigation, usually for a fee. It undertakes very little project promotion and institutional development. Its emphasis is on client development and marketing.

f. Strategic Goals: A development bank has a more difficult strategic objective because it is involved with the concerns of the country, specifically economic development. Aside from this, after providing financing, it is also concerned with developing the enterprise. Developing them explicitly would mean additional costs to the bank. Enterprise development dramatically limits the number of accounts that a development can handle because this is time-consuming. A commercial bank's main concern is to generate profits. Other benefits are only incidental. With a commercial bank's cost-consciousness, economic development would be its last priority.

g. Criteria for Financing: A development bank assumes project risks and does not insist on too much collateral. It will provide financing as long as the other criteria are met. A commercial bank pays less attention to the project in relation to the collateral requirements. However, the more progressive banks are lending against project cash flow and without collateral.

h. Assessment of the Loan Proposal: A development bank employs project appraisal as a means to determine the viability of the project submitted for financing.

Project appraisal looks at the technical, financial, marketing, management, environmental and economic aspects of the project. Loan repayment is based on the cash flow to be generated by the project. A commercial bank uses risk asset management as tool to assess the borrower. It looks at the so-called 5 C's of credit, i.e., character, capacity, capital, collateral and condition. It bases loan repayment on the capacity of the borrower to pay (even from other sources) than from the 'project' itself. Thus, it can be said that development bank financing is *project-focused* while that of a commercial bank is *borrower-oriented.*

i. Term of Loans Extended: A development bank provides mainly *term loans* (maturity of more than one year). On the other hand, a commercial bank provides mainly *short-term loans* (less than one year maturity).

j. Sources of Loan Funds: A development bank is dependent on concessionary, long-term funds, e.g. pension funds, funds from multilateral financial institutions like the World Bank, Asian Development Bank, etc. It has traditionally limited access to domestic or commercial funds. A commercial bank has a strong deposit base and its corporate borrowers are also depositors. They can match its commercial borrowing against its own short-term loans.

k. Lending Policies for Cyclical Industries: A development bank supports its clients in spite of short-term cycles while a commercial bank does not like cyclical industries.

l. Resource Mobilization: A development bank undertakes project promotion work to match concessionary long-term financing while a commercial bank mobilizes deposit funds from small depositors which are lent out to large companies.

m. Client Relationship: A development bank relates more to clients as borrowers. There is less day-to-day business relationship. Trade transactions of a commercial bank allow for frequent monitoring and close client relationship.

n. Scope of Institutional Mandate: A development bank is essentially a specialized institution. It has limited branching and range of products. The commercial bank has a generalized charter. It can offer a wide range of products (especially in the case of universal banks) and can open more branches.

2.1.4. Basic Requirements to Access Credit

In order to at least minimize the inevitable credit risks, according to (Ghatak and Guinnane, 1999) a thorough credit assessment should be conducted by the lenders especially concerning the borrowers` character, collateral, capacity, capital and condition (what is normally referred to in the banking circles as the 5C`s) should be conducted if they are to minimize credit risk. Such gathering of information is possible primarily from your credit application and a credit bureau report, to determine whether borrowers are able and willing to repay the 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 is 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 borrowers profile is an assurance that a debt could be paid from the borrowers 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.

2.1.5. Performing Loans

The principal profit- making activities of banks are loans. In allocating funds, the primary objective of bank management is to earn income while serving the credit needs of its community. Therefore, Lending

represents the heart of the industry. Loans are the dominant asset and represent 50-75 percent to total amount of assets at most banks, that generate the largest share of operating income and represent the banks greater risk exposure (Mac Donald and Koch, 2006).

Loans and advances are defined in the respective laws of different countries. In Ethiopia, under Article 13 (FDRE 592/2008) and (NBE/43/2008) Article (4.6) loans and advances are defined as:

"... Any financial assets of a bank arising from a direct or indirect advance (i.e. unplanned overdrafts, 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 by the bank on behalf of a person. The term does not include accrued but uncollected interest or discounted interest."

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.

Because of controllable and uncontrollable factors, it is unlikely to have 100% of collection of loan. Controllable factors are bank specific factors that are controlled by firm level and reflect overall bank credit policy as well as inadequate credit analysis, loan structuring, and loan documentation, etc. Uncontrollable factors are external factors or macro-economic factors that are not controlled by firm level. It reflect adverse economic conditions, adverse change in regulation, environmental change surrounding the borrower's operation, and catastrophic events. So, in reality some of the loan will be nonperforming (Daniel T, 2010).

So, loan may be considered as performing if payments of both principal and interest charges are up to date as agreed between the creditor and debtor. Therefore, managing loan in a proper way not only has positive effect on the banks performance but also on the borrower firms and a country as a whole. Failure to manage loans, which make up the largest share of banks assets, would likely lead to the episode of high level of non-performing loans.

2.1.6. Nonperforming Loans: Meaning and Nature

Providing loans to their customers are the principal functions of banks. In allocating funds, the primary objective of banks was to earn income while serving the credit needs of its community. Lending represents the heart in banking industry. According to (Mac Donald and Koch, 2006) Loans are the dominant asset and represent fifty percent to seventy five percent to the total amount of banks assets. In most banks loans generate the largest share of operating income and represent banks greater risk exposure.

The lending function is considered by the banking industry as one of the most important function for the utilization of funds. Loans and advances are the most profitable of all assets of banks and constitute the primary source of income by banks. Banks are business institution; hence, want to make as much profit as possible through extending loans and advances. But due concern has to be given and banks have to be careful about the safety of such advances, according to (M. Radha, and SV. Vasudevan. 1980).

Banks provide loans and advances in the existences of asymmetric information, certain level of risks are inevitable. Accordingly, due to controllable and uncontrollable factors, it is unlikely to have 100% of collection of loan and advances in reality. Loan defaults are inevitable given the uncertainty of the future economic conditions and the existences of other controllable and uncontrollable factors. The main issue is how to minimize the rate of this risk? How to increase asset quality of financial institutions, or minimize the rate of non-performing loans by identifying factors that causes it?

Non-performing loans are closely associated with banking crises. Many authors argue that the magnitude of non-performing loans is a key element in the initiation and progression of financial and banking crises. Unless properly managed and kept at reasonable standard non-performing loans (NPLs) often associated with bank failures and financial crises in both developing and developed countries (Gebru Meshesha, 2015). The issue of non-performing loans (NPLs) has gained increasing attentions in the last few decades across the globe because the immediate consequence of large amount of NPLs in the banking system is bank failure. The issue of loan default is related with none recovery/repayment of loans. When a borrower cannot repay interest and/or installment of the loan after it has become due, then it is qualified as default loan or non-performing loan. It is known as non-performing, because the loan ceases to "perform" or generate income for the bank.

Our world has experienced banking crises in different times. Banking crises in turn cause very bad economic conditions. Historically, the occurrence of banking crises has often been associated with a massive accumulation of non-performing loans which can account for a sizable share of total assets of insolvent banks and financial institutions, especially during a period of systemic crises. Nonperforming loans generally refers to loans, which for a relatively long period of time do not generate income; that is the principal and/or interest on these loans has been left unpaid for at least 90 days. The economic and financial costs of bad loan are significant. Potentially, these loans may negatively affect the level of private investment, increase deposit liabilities and constrain the scope of bank credit to the private sector through a reduction of banks' capital, following falling saving rates as a result of runs on banks, accumulation of losses and correlative increased provisions to compensate for these losses. Impaired loans also have potential for reducing private consumption, and in the absence of deposit guarantee mechanisms to protect small depositors can be a source of economic contraction, especially when coupled with declining gross capital formation in the context of a credit crunch caused by erosion of banks' equity and asset (Fofack, 2005).

The definition of NLP varies across countries; there is no global standard to define nonperforming loans at practical level. The concept has been defined in different literatures and by different scholars using different parameters. Criterion for identifying non-performing loans varies throughout the world even between countries. Some countries use quantitative criteria to distinguish between "good" and "bad" loans like the number of days overdue, schedule payments while others rely on qualitative standards like the availability of information about the client's financial status, and management judgment about future payments as used by (Teshome, 2010).

According to the International Monetary Fund, a non- performing loan (NPL) is any loan in which interest and principal payments are overdue for 90 days or more. A number of other literatures have also tried to define NPLs in their own ways. Even though, attempts are made to define NPL by different institutions and scholars in different ways, still all of them indicate NPLs are Loans that are outstanding in both principal and interest for a long period of time contrary to the terms and conditions contained in the loan contract.

Different endeavors are also made by a number of writers and authors to define what is meant by bad or Nonperforming loans as per their understanding of the subject matter. Machiraju (2001) for instance, expresses NPLs as a leading indicator of credit quality. NPLs or bad loans arise in respect of the loans and advances which are given by banks to the whole range of different projects including but not exclusively

retail or wholesale, personal or corporate or short, medium or long term projects. NPLs are very sensitive elements of a bank's operations.

Another writer that attempted to define nonperforming loans are Caprio and Klingebiel (1996), cited in Fofack (2005). They defined non-performing loans as those loans which for a relatively long period of time do not generate income that is, the principal and or interest on these loans have been left unpaid for at least ninety days. The authors further supported that non-performing loans are the loans which are not generating income. According to (Guy, 2011), Nonperforming loans are also commonly described as loans in arrears for at least ninety days and nonperforming loans have been widely used as a measure of asset quality among lending institutions and often associated with failures and financial crises in both developed and developing world.

Non -performing loans can also be defined as defaulted loans, which banks are unable to profit from it (Tihitina, 2009). Usually loans fall due if no interest has been paid in 90 days, but this may vary between different countries and actors. Defaulted loans force banks to take certain measures in order to recover and securitize them in the best way.

From all these definition, it's very clear that nonperforming loans occurs when a debtor has not met his or her legal obligations according to the debt contract like where debtor has not made a scheduled payment, or has violated a loan covenant of the debt contract.

Likewise, Ethiopia has also defined what is meant by nonperforming loans under National Bank of Ethiopia's (NBE's) Directive no, SSB/43/2008.

It defines nonperforming loans as; *"loans or advances whose credit quality has deteriorated such that full collection of principal and/or interest in accordance with the contractual repayment terms of the loan or advances in question"*

It further provides that:

…, loans or advances with pre-established repayment programs are nonperforming when principal and/ or interest is due and uncollected for 90 (ninety) consecutive days or more beyond the scheduled payment date or maturity".

In our country, therefore, loans become nonperforming when it cannot be recovered within certain stipulated period of time that is governed by some respective laws. Accordingly, the following conditions must be met to categorize some loans under nonperforming one:

a. A loan that is not earning income;

b. Full payment of principal and interest is no longer anticipated;

c. Principal or interest is 90 days or more delinquent or;

d. The maturity date has passed and payment in full has not been made.

Hence, in Ethiopia, if a loan is past due 90 consecutive days, it will be regarded as non- performing. The criteria used in Ethiopian banking business to identify non-performing loan is a quantitative criteria based on the number of days passed from loan being due.

2.1.7. Loan classifications in Ethiopia

The classification of loans into performing and nonperforming loan is not appropriate in reality. Loans may take different other status than these two extreme classifications. As per directive number SBB/43/2007 loans are classified into five classes.

1. 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.

2. 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 borrowers 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.

3. 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

4. Doubtful loans: There are very serious questions about the borrowers 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.

5. 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 nonperforming. 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. Development Bank of Ethiopia

Among the formal source of credit in Ethiopia, Development Bank of Ethiopia is providing loan and technical support for viable projects on the bases of individual credit. In line with this, Development Bank of Ethiopia, Jimma District has scored the following performance during the fiscal year that ended June 30; 2015. The District has approved 2.123 billion birr and has achieved 386 percent of its plan. During the same budget year, a total of 1.351 billion birr has disbursed to different sectors of the economy especially agricultural projects. This revealed 223% of its plan has achieved. Regarding to loan collection, a total of 106.87 million birr was collected with registering 60% achievement (DBE annual report, 2015).

Based on DBE annual reports of 2011/12, 2012/13, 2013/14 and 2014/15, Jimma District has scored some how good trend of non-performing loan ratio where 47% in 2011/12 fiscal year towards 9.58% in 2014/15, 2015/16 which is in line with the vision of the bank to be achieved by 2020. However, it needs also some reduction in the coming years by using different rehabilitation mechanism. On the other hand, loan repayment performance from whole projects including both healthy and unhealthy projects were face difficulty as we seen relative to its own plan as well as number of projects that actually approved, where scored performance not less than 100% of its plan within in those periods.

2.2.1. The Main Functional Areas of the Bank

The Bank is extending investment credits to creditworthy borrowers and projects that have received a thorough appraisal and found to be financially and economically viable and socially desirable. Based on the nature of the projects, DBE is providing long and medium term loans as well as short-term working capital as a package. The term of loan is, however, to be determined based on the specific needs-and-requirements of the projects. According to revised credit policy on 2016, the bank is providing:

New Loans: As per the current working credit policy and procedure of the bank all borrowers who wish to obtain financing for new priority area projects are required to provide the minimum equity contribution of 25% of the total project cost in cash. The cash contribution placed upfront or gradually over a period not to exceed 6 months from the loan contract signing date. The Bank will finance the remaining balance up to a maximum of 75% of the total project cost after utilization of the 25% equity contribution by the borrower.

Expansion Loan: as per current working credit policy of the bank, all borrowers who wish to obtain financing for the expansion of an existing priority area project and whose assets of the existing project are not collateralized can access 100% financing of the expansion cost provided that the value of the existing asset covers 40% of the total project cost. This means that the debt to equity ratio stands at 60:40. For any cash contribution made by the promoter to cover the shortfall, the promoter can access additional loan from the bank according to the debt to equity ratio of 60:40.

Working Capital Loans: in addition to the permanent working capital that is part of project cost, working capital loan serves as bridge finance and is availed based on the cash flow of the project itself. The purpose of working capital finance is for extension of inventory cycle, increase capacity utilization and cover short-term cash flow problem of existing customers.

Co-financing (Syndicate Financing): in order to maintain the exposure limit, minimize risks and to overcome occasional liquidity problems, the Bank may finance projects involving very large amount of investment capital under co-financing arrangements with other national or international financial institutions.

Guarantee Services: the Bank is providing financial guarantee services to its reliable clients. Export credit guarantee service, on the other hand, is provided to well performing clients of other banks/financial institutions with reliable and or good record of accomplishment.

Lending Managed Funds: the bank may undertake lending operations for supporting development projects from managed fund at the request of governmental or non-governmental agencies.

Loan Transfer: healthy loans (loans performing as per the contract entered between the borrower and the Bank) can be transferred to new clients upon the written request of both the original and the new clients. However, the new clients' credit worth capability to run the project should be confirmed by conducting the required due diligence or KYC assessment and the request should be approved by the loan approval team.

Loan Buy-out: the Bank may buy-out loans extended by other local banks and local microfinance institutions. However, the loans to be purchased under the buyout loan facility should be: Viable/ongoing concern (operational) and Priority sector project loans.

Lease Financing: lease financing is a service in which the Bank provides financial service for purchases of machineries, equipment and accessories for priority area projects. Whereby the lessee pays 10% of the purchasing price of these assets to the Bank in advance and the lessee either returns the assets to the Bank or purchases them at agreed price at the end of the lease period (revised credit policy, 2016).

Loan Processes

According to DBE loan procedure and manual (2016), the Loan Process of the Bank is designed to serve the customer with a shortest possible time, minimum cost and high quality. This process starts its function by attracting and persuading customers to apply for investment loans and ends at loan collection. This loan process encompasses the following four independent loan-processing teams at corporate and District level to handle loan-processing activities at various stages and responsibility levels:

Figure 2. 1Loan process of DBE

CREDIT TEAM	APPRAISAL TEAM
• Due deligence • screening	• Feasibility study • Propose amount

REHABILITATION TEAM	APPROVAL TEAM
• Sick projects	• Over all policy decision • approve/reject
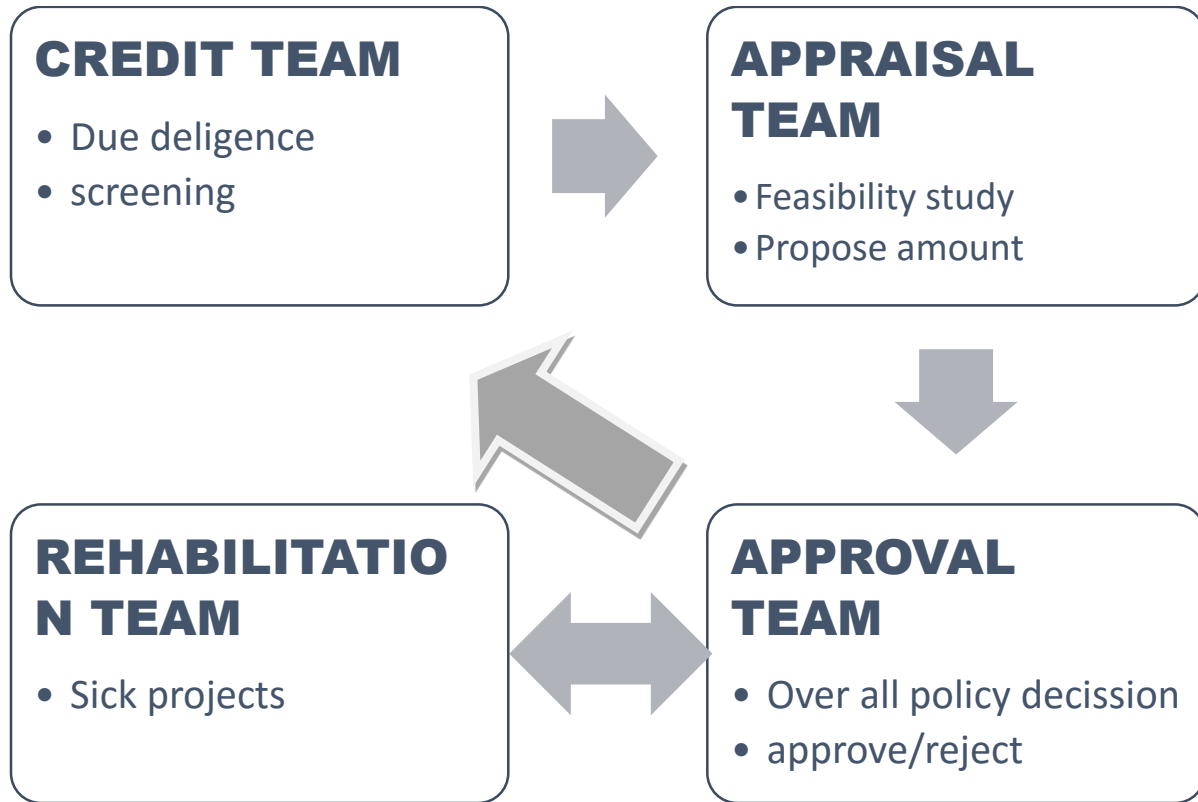
- Credit Process;
- Project Appraisal teams at District;
- PRLR team at Districts; and
- Loan Approval team

Credit process

The Bank accepts applications from both recruited and walk-in customers if they fulfill the Bank's loan requirements branches (credit process) undertake. The recruiting customers by attracting and persuading potential applicants using appropriate means of communication. On the other hand, due diligence or KYC assessment undertake by the Bank to identify the integrity of the borrower. This is done to protect the Bank from entering into relationships with inappropriate borrowers and to check the borrower's creditworthiness.

Project Appraisal The project appraisal document focus on assessments and evaluations of the technical, market, financial, and managerial viabilities as well as socio-economic benefits of projects. Within their study report, market aspect of the project such as demand and supply analysis, market prospects and major marketing areas of the proposed product or service, marketing strategy and arrangements for the products or Services, price analysis for the products/services of the project and strengths, weaknesses, opportunities and threats (SWOT Analysis) of the project.

Technical assessment includes location and site, project engineering, availability of utilities, availability of inputs, production process and system of production, project implementation plan and environmental impact assessment of the project. Project management aspect includes organization, management and labor issues. Financial analysis (investment cost, working capital requirements, pre-operating costs, financing scheme, equity requirement of the customer, revenue estimates and operating costs, projected financial statements, viability and measures of project worthiness, working capital determination). Economic and social benefits and costs, conclusion and recommendation, loan repayment schedule, etc. are also included as a part of appraisal document.

Loan Approval: Once loan applications for financing of development projects are received and screened for appraisal by the Credit Process/branches, the Projects Appraisal District appraisal teams appraises the project, it needs to be decided by the District Loan approval team. The LAT is to make decisions on the approval or rejection of the loan. In this process, the Loan Approval Team deliberates and decides on the loan approval document to accept or reject the loan proposal. Once the loaning decision is made in the Loan approval Process/team, the case goes back to the Credit Process/branch for subsequent actions. Once the loan is approved through the LAT, it comes back to the branch for facilitation and follow-up of loan contract signing between the Bank and the borrower. After signing and registering of the loan contract is compliance check for disbursement/equity utilization release to ensure that the borrower has fulfilled all the requirements as per the agreement stipulated in the loan contract. In checking loan disbursement/equity utilization, the credit process or branches use the Equity Release and Loan Disbursement Request Approval Formats of the Bank.

Project Rehabilitation and Loan Recovery (PRLR)

Once a project is identified as sick in accordance with the above definitions and could not be resolved by the branch, it will formally transferred to the District PRLR team, where a thorough analysis will be conducted in order to decide whether the project can be rehabilitated. Such projects can be given relief and concessions,

as and when necessary, depending on their specific nature. The following are some of the relief and concessions that may be extended by the Bank to sick projects for rehabilitation.

- Management Intervention: the Bank may intervene into the management role of a given project by overtaking its day-to-day management tasks fully or partially.
- Provision of Additional Working Capital Loans: if provision of additional investment and/or working loans is deemed necessary for rehabilitation of projects, it should be entertained accordingly.
- Loan Repayment Rescheduling: whenever loan repayment rescheduling is found to be the best project rehabilitation mechanism, it should be implemented accordingly.

- Loan Transfer to Third Party: as an option for project rehabilitation task, upon agreement among the Bank, the customer and a person willing to take over the project, projects (loans) can be transferred to third party as a rehabilitation mechanism.
- Different debt-equity ratio: In some cases, the PRLR team may propose higher debt-equity ratio. The newly higher debt-equity ratio to be proposed based on the existing realty of sick projects and it must justify that the sick projects will be rehabilitated. The PRLR team can also propose a different mode of loan repayments so that the sick projects may not face cash constraints for the rehabilitation tasks.

2.3. Empirical Literature

In this part of the proposal different related literatures and studies will be critically analyzed and presented. Accordingly, the first section emphasizes on any literatures and studies on factors affecting loan repayment performances anywhere in the globe followed by related literature reviews conducted in Ethiopian context and finally attempts will be made to reveal the reason why this study is found essential.

Different studies have been conducted regarding the determinant of loan repayment delinquency and default especially on commercial banks, microfinance and agricultural credit borrowers by using different technique of analysis. Among others binomial logit or probit regression model, multinomial logit or probit and tobit are widely use and some of them are presented show the effect of those factors on loan repayment delinquency and default.

To begin with, Munene, et al.(2013), in his study of Factors Influencing Loan Repayment Default in Micro-Finance Institutions: The Experience of Imenti North District, revealed that there was significant relationship between the type of business, age of the business, number of employees, business profits and loan repayment

default. There is strong link between technical training for loan beneficiaries and the performance of entrepreneurial businesses among the remote communities. The study was conducted on 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.

Another related study by Vigano, Lawra (1993), under a title "A Credit Scoring Model for Development Banks: An African Case Study" has identified some important factors using a credit-scoring model. Taking the case of Development Bank of Burkina Faso, Vigano found out that being women, married, aged, proximity to the bank, use of better technology and being flexible to adjust to market changes, proper use of the loan, project diversification, frequency of loan maturity, collateral, personal guarantee and being a pre-existing depositor are negatively related to loan default risk. Loans in kind, long weighing period from application to disbursement and being younger firm, past default, existence of other loan are those positively related to loan default rate.

A study made on loan repayment determinants under the Social Emergency Loan Scheme (SEALS) in Nigeria by Njoku and Odii (1991) employing multiple regression model based on

300 sample beneficiaries (9.3% of the total population) indicated that poor loan repayment performance was due to late release of loan funds, cumbersome loan application and disbursement procedures and emphasis on political considerations in loan approvals. In addition, loan diversion to non-agricultural enterprises as well as low enterprise returns resulting from low adoption rate of improved agricultural technologies contributed to poor loan repayment performance of small holders. Loan volume, years of farming experience, farming as major occupation, years of formal education, family size, loan period, farm size, farm output, value of assets and interest paid on loan were all highly significant determinants of loan default. The coefficients of loan volume, years of formal education, family size and interest paid on loan are positive while the coefficients for years of farming experience, loan period, farm size, farming as major occupation, farm output and value of assets are negative.

Olomola (1998) was also utilized multinomial logit regression model for the analysis of loan repayment determinant by grouping the dependent variable as well as explanatory variables. i.e., the dependent variable

is loan repayment performance (good credit risk paid or due < 30day, delinquent those who were paid within 90 day from the due date and defaulter who were no fully paid after 3 month from the due date. Whereas the independent variables are factor of loan repayment were classified as borrower related, loan related, lender related and extraneous factor.

There was a 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 result indicted that crop sales, income transfers, degree of diversification and quality of information are positively related while size of club is negatively related to the probability of repayment. Other factors like amount of loan, gender, family size and club experience were found to be insignificant.

Using probit model of data analysis, Yacob (2014) analyzed the socio-economic factors that affect the institutions 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 size 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.

Another research conducted in Ghana using probit model to identify factors affecting loan repayments by the farmers of Brong Ahafo District of Ghana. Awunyo-Vitor (2012) searched the determinants of loan repayment default among farmers in Brong Ahafo District of Ghana. The study employed Probit model to investigate factors that influence farmers loan repayment default. Data used in this study was gathered through a survey of 374 farmers in five Districts within Brong Ahafo District 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 size and longer repayment period as well as access to training are more likely to reduce loan repayment default.

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.

The study by Oladeebo and Oladeebo (2008) confirmed that income, gender, farm size, age of farmers, years of farming experience with credit, size of loan, family 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.

The other important study was done by Arene(1992). He evaluated the credit delivery system of Supervised Agricultural Credit Schemes among smallholder maize farmers in Nigeria employing multiple regression analysis. The result based on 95 sample maize farmers showed that high repayment farmers had larger loan size, larger farm size, higher income, higher age, higher number of years of farming experience, shorter distance between home and source of loan, higher level of formal education, larger family size, higher level of adoption of innovations, and lower credit needs than low repayment farmers. The regression analysis showed that size of loan, farm size, income, age, number of years of farming experience, level of formal education and adoption of innovations are significantly and positively related to repayment rate, Distance between home and source of loan, family size and credit needs were found to be negatively related to repayment rate.

Causes and treatment of NPLs were studied in detail by Bloem and Gorter (2001). They agreed that "bad loans" may considerably rise due to abrupt changes in interest rates. They discussed various international

standards and practices on recognizing, valuing and subsequent treatment of NPLs to address the issue from view point of controlling, management and reduction measures.

A study conducted by Espinoza and Prasad (2010) focused on macroeconomic and bank specific factors influencing NPLs and their effects in the Banking System. After a comprehensive analysis, they found that higher interest rates increase NPLs but the relationship was not statistically significant.

The other study evaluated the factors influencing on repayment performance of farmers in Khorasan Razavi province of Iran. The logit model seeks to explain the probability of loan on time repayment because of any of the identified independent variables. The signs of the coefficient of independent variables and significance of the variables were used determining largely the impact of each variable on probability of dependent variable. Results showed that farmer"s experience, income, received loan size and collateral value have positive effect while loan s loan interest rate, total application costs and number of installment implies a negative effect on repayment performance of recipients (Kahansal & Mansoori, 2009)

The authors like Sinkey and Greenwalt (1991) by employing a simple log-linear regression model and data of large commercial banks in the United States from 1984 to 1987 investigate the loan loss-experience of large commercial banks in the US; they argue that both bank specific and macro-economic factors explain the loan-loss rate (defined as net loan charge offs, charge off rate which is also known as NPL rate) plus NPLs divided by total loans plus net charge-offs of these banks. The authors find a significant positive relationship between the loan-loss rate and internal factors such as high interest rates, excessive lending, and volatile funds. Similar to other study, the authors further report that depressed District economic conditions also explain the loss-rate of the commercial banks.

The findings above revealed that the probability of loan repayment depends on the borrowers' specific characteristics (i.e. age, education, experience, gender, family size, loan utilization, e.t.c.), institutions specific (i.e. repayment installment, collateral, frequency of maturity, grace period, loan volume, interest rate, number of disbursement, e.t.c.) and other factors such as business type, political influence, technical advice, level of social cohesion (for micro enterprises), e.t.c. The strong side of the empirical studies reviewed above is that they assessed al1 sources of loan default, which is the borrowers` willingness and ability of repayment, the lenders` loan administration capacity, and other external economic factors.

From all studies discussed above, one can observe different financial institutions in Nigeria, Spain, China, Kenya, Iran, Tanzania and others are assessed in relation with different factors that causes nonperforming

loans and forwarded their finding and recommendations for these countries. For example, In Kenya banks shift away from concentration on security based lending and put more emphases on the customer ability to meet the loan repayment and in China NPLs is transferred to Asset management (Waweru and Kalani, 2009).

So, it is appropriate to study what exactly affects loan repayment performances in Ethiopia.

2.4.   Empirical Studies in Ethiopia

In this part, the Ethiopian literatures will be reviewed. Actually, there is no sufficient literature (published) in our country, but some of the relevant studies are reviewed in the next section of this paper.

Michael (2006) has analyzed the impact of factors on loan repayment performance in informal sector of financial institutions in Addis Ababa by grouping the independent variable (i) Borrower related causes; (ii) Causes related to business operation; (iii) Lender related causes and (iv) Extraneous causes, A positive coefficient shows that the variable is associated with a higher probability of being in the delinquent category than that of being in the good credit risk category. On the other hand, a negative coefficient indicates that the variable is associated with a lower probability of being in the delinquent category than that of the good credit risk category.

In another relevant study by Abreham (2002) an investigation of determinants of repayment status of borrowers and criteria of credit rationing were conducted with reference to private borrowers around Zeway area who are financed by the DBE. The estimation result employing tobit 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 loan recovery performance.

Jemal, (2003) make a research on Microfinance and loan repayment performance, which was a case study of the Oromia Credit and Savings Share Company (OCSSCO) in kuyu, the study area, Kuyu is found in Oromia National Districtal State (ONRS). In his research methodology, he employed a logit model to find the factors influencing on loan repayment performance in the micro finance institution. The sample size is 203, which is 9.3 percent of the total beneficiaries of the micro finance institution.

The independent variables used on the research includes, age of borrower, gender of borrower, educational level of borrower, loan size in Birr, timeliness of loan release, loan diversion rate (ratio of loan diverted to total loan receive, income from activities financed by loan (annual), annual income from other activities (not

financed by the loan), value of livestock in Birr, suitability of repayment period, use of financial records, adequacy of supervision visits made to a borrower, location of residence of borrower, number of dependents number of times borrowed.

The estimation results of the descriptive statistics and the tobit model show that education, income, loan supervision, suitability of repayment period, availability of other credit sources and livestock are important and significant factors that enhance the loan repayment performance, while loan diversion and loan size are found to significantly increase loan default. In addition, female borrowers were found better in terms of loan repayment.

Wondimagegnehu Negera (2012) in his study "determinants of NPLs on commercial banks of Ethiopia" revealed that underdeveloped credit culture, poor credit assessment, aggressive lending, botched loan monitoring, lenient credit terms and conditions, compromised integrity, weak institutional capacity, unfair competition among banks, willful defaults by borrowers and their knowledge limitation, fund diversion for unexpected purposes and overdue financing has significant effect on NPLs. Conversely, the study indicated that interest rate has no significant impact on the level of commercial banks loan delinquencies in Ethiopia.

In order to analyze such determinant factors for successful loan repayment performance at bank, researches has done at north District of DBE. According to the study of Kibrom (2010), factors that determine loan repayment performance include; borrowers perceived need that is borrowers have to be given an opportunity to borrow for their perceived needs, competence that is the borrowers past personal and profit record, past prosperity etc. Borrowers personal character which were related with personal qualities of the borrower including age, gender, educational level, house hold size, management capacity, loan utilization, availability of other sources of income, bank experience etc. Factors which are related with the bank such as structure of the bank, change in the lending policy, way of appraising the project, responsibility and accountability of the staff members and external factors related with the macroeconomic condition of the country, government policy and natural factors had analyzed.

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.

The study by Arega seyoum(Dr) and Tadele Tesfaye(2016) on factors affecting nonperforming loan in central District of Development Bank of Ethiopia, using descriptive statistics including mean, frequency and percentages and processed through computer loaded SPSS software and by collecting both primary and secondary data. The study mainly focuses on bank specific and borrowers' specific factors to establish the relation between different variables and the nonperforming loans. This study was conducted in central District of the bank, where the money borrowed from the bank was invested mainly on industry and service sector of the economy. Hence, it is not appropriate to deduct the finding to the cases of Jimma District.

Generally, the Empirical researches on loan repayment performance in Ethiopia are not comprehensive enough to cover all scenarios. For instance, the research by Abraham 2003 was conducted in Development Bank of Ethiopia; however it is limited to loan repayments and its determinants in small scale enterprises. The study by kibrom Tadesse (2010) conducted on successful loan repayments was on Development Bank of Ethiopia in North District. It mainly focuses on determinants of successful loan repayment performances in Northern part of the country where the loans are mainly allocated for industrial investments, and did not cover the other side of repayment performances (which is NPLS). Another study conducted on factors affecting nonperforming loans by Arega Seyoum(Dr) and Tadelle Tesfaye(2016) (both are Jimma University lecturers) was conducted on Development Bank of Ethiopia Central District where the economic sector the loan was utilized was mainly industry and commercial horticulture. The study focuses basically on non-performing loans and limited to bank specific and borrowers' specific factors to establish relationship between variables and non-performing loans.

All of the above empirical studies fail to address the fact that factors other than those bank specific and borrowers specific would also affects repayments of loans. In addition all of the studies were conducted in a geographically industrialized area of the country and the unique characteristics of agricultural investments which are prevailing in Jimma District is not covered by the studies. Furthermore, now a day there are many

changes regarding the bank policy, interest rate, introduction of new products, organizational structure as well as the general macroeconomic condition of the country and the world.

Therefore, this research will contribute towards filling the gap by identifying and analyzing the factors affecting loan repayment performances in Jimma District, in which no research is conducted and most of the borrowers are engaged in the agricultural and service giving sectors.

CHAPTER THREE:

RESEARCH METHODOLOGIES

In the preceding chapter the review of related literature on factors affecting loan repayment performances, the empirical studies and their respective findings are presented. As loan repayment performances basically comprises of performing and non-performing loans, different studies related to both scenarios were thoroughly reviewed under the preceding chapter. This Chapter presents the methodology that provides a detailed direction about the methods that the researcher used in conducting the research. Hence, the research design, description of the study area, data type and source, methods of data collection, sampling techniques, methods of data analysis and definition variable, measurement and description of variables are discussed.

3.1. Research Design

Research design is a comprehensive plan. It is a blueprint for empirical research aimed at answering specific research questions or testing specific hypotheses (Anol Bhattacherjee, 2012). Research design is the program that guides the researchers in the process of collecting, analyzing and interpreting the data.

Therefore, the nature of problem and objective of any study usually determine the type of research design adopted by researcher. A choice of research design reflects the priority of a researcher about the dimensions of the research process and methods. The objective of this research is to identify the factors affecting loan repayment performances in Development Bank of Ethiopia, Jimma District. The collected data mainly focused on description of borrower's characteristics, lending institution/bank related factors, business/project related factors and external factor that affects loan repayments and their relationship among the dependent and explanatory variables. Therefore, both qualitative and quantitative research method were used in the study.

3.2. Description of the Study Area

The geographical study area of this research is located in the south western part of the Ethiopia and comprises some parts of three National regional states. Accordingly the geographical coverage of the area includes Jimma zone, Buno Bedelle Zone and Illu Abbabor Zone from Oromia National regional state, Kafa zone, Benchi Madji Zone, Shaka and Dawro zone from South Nations and nationalities regional state and the whole region of Gambella Peoples regional state. This area is categorized as ever green and suitable area for

agricultural and commercial farming investments according to DBE loan manual. Currently Development Bank of Ethiopia has about 12 Districts all over the country. Jimma District is one of such Districts covering the above listed administrative zones from three regional states. Development Bank of Ethiopia Jimma District has two grade "A" branches (Jimma branch and Gambella branch) and six grade "C" branches (Matu, Bedelle, Agaro, Bonga, Mizan and Teppi branches).

Pursuant to the currently existing organizational structure of the bank grade A branches can provide credit to their borrowers and administer their active loans, while the role of grade C branches were limited to collecting repayments from old loans and handling inactive loans. There is also a team called Project Rehabilitation and Loan Recovery Team (PRLR) responsible to handle sick/nonperforming loans under the District. In this study, grade C loans are excluded from the population of the research for they are totally dead and write-off and hence, the population of the study is limited to loans under the District office (grade A branch) borrowers and sick loans handled by PRLR team under the District.

3.3. Data Type and Source

The data employed in this study is both primary and secondary data. Accordingly, the primary source of data was collected through questionnaire and interviews from the sample population. A structured and semi structured questionnaire with open ended and closed ended type was distributed and collected from 150 borrowers identified using stratified sampling from the loan position of the District as of June 30, 2016. It excludes borrowers whose repayment installment has not yet matured because it would be premature to assess the real performance of the projects as well as credit worthiness of the borrowers unless they are practically tested by their repayment record. The staff borrowers were also excluded from the population of the sample because, such loan is either personal loan or housing loan which are basically the privilege to the staff members of the bank and the repayment performance for such credits are very much secured as long as the employee remains the worker of the bank. Further, such loans didn't qualify the requirements of financing for projects/working capital loans, hence excluded. The financial position of the borrowers at the end of fiscal year i.e. June 30, 2016(the bank's financial statement closing date) is considered was used as another of source data.

Primary data: The primary data was collected from original source (borrowers) through questionnaire. 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.

Secondary data: secondary data were used as a source of data in this work to determine the repayment performances of the bank in the previous consecutive years and to determine the sample size population of the study. Especially, annual reports, loan portfolio of the banks and others publications of the bank were used as a secondary data.

3.4. Method of Data Collection

In order to achieve the objectives stated in the preceding section and considering the nature of the problem and the research perspective, the researcher used both quantitative and qualitative data. The Primary data were collected through primary data collection techniques mainly using structured and semi structured questionnaire and interviews with the officials and senior officers of the bank. Secondary Data were directly gathered from records and published documents of the bank. The data collected include aggregate loans outstanding balances, NPLs as at the annual closing date, June 30 2016 and others as found appropriate. For the purpose of comparison the surveyed banks data for the years preceding and following years performances were also considered.

3.5. Population and Sampling Method

Determining type and method of sampling mainly depends on the types of population that the study covers. According to (Kothari, 2004), 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.

Hence, Sample selection was based on stratified sampling where borrowers were selected based on the diversified investment activities they are carrying on and in proportion to the population classification in terms of their loan status. The loan position of the District shows that as of June 30, 2016, the total number

of borrowers including the staff loans in Jimma District (Jimma Branch, Gambella branch, PRLR team of the District and the remaining six branches) was three hundred seventy five (375). From the total loans 84 of them were staffs loans (short and long staff loan), and 18 were not matured yet, the remaining 273 loans were listed in the loan position of the District having different loan status and in all cases their first loan repayments is mature. Thus, the total population of the study is 273. Out of these, 217 loans were performing loans/non-defaulters and the remaining 56 were defaulters (loan status including substandard, doubtful and loss). According to their loan status, 79.49% of the total populations were performing loans while the rest 20.51% were nonperforming. Borrower whose maturity date is not yet due and Staff borrowers are excluded from sampling of population because loans for employees is mere privilege and didn't qualify the requirements of provision loans for other businesses and its repayment is almost granted as long as the employee remains in the bank. On the other hand, in case of loans which are not matured yet, it was excluded from sampling because it is difficult to study about the factors affecting loan repayment performances while the loan is not yet matured, it will be prematurity. Therefore, based on proportional stratified random sampling the samples of 150 borrowers were selected, out of which 110 were performing loans and 40 were defaulters. In addition, two principal officers from each team (credit team, appraisal team and approval team), two senior officers from different teams, Jimma and Gambella branch managers and Jimma District manager was interviewed, their comments and ideas are used in interpretation and recommendation of the study.

3.6. Method of Data Analysis

The data collected through the above stated techniques were thoroughly coded and checked for consistency and analyzed and interpreted using both descriptive statistics and econometric analysis. Accordingly, the researcher analyzed the data using descriptive statistics (frequencies, percentages, mean, and standard deviation) to obtain information on the factors affecting loan repayment performances and binary logistic econometric model (logit) was used to identify the factors of loan repayment ability in Development Bank of Ethiopia Jimma District. Descriptive statistics was employed to analyze the data and the results were tested with non-parametric tests of significance, whereas econometric analysis, specifically binary logistic regression was used to identify statistically significant variables in relation to the dependent variable. Loan repayment performances refers to the ability/capability of borrowers to duly repay loans or fail to repay their loans. Hence, the dependent variable is dummy variable. If Borrowers experienced well repayment performances the dependent variable takes a value of 1, and if the borrowers fail to repay their loans as per the terms of agreements/contracts the dependent variable take the value of 0. So, the level of significance

and influence of each independent variables where defined and identified using both descriptive and econometric analysis against the dependent variable.

Finally the analyzed data was presented in the form of table and percentage in order to make the data understandable and attractive detailed statement would support these tools.

3.7. Model Specification

Data collected through the above stated methods were analyzed using different techniques. According to (Kothari, 2004) data analysis requires a number of closely interrelated operations such as establishment of categories, the application of these categories to raw data through coding, tabulation, and then drawing statistical inferences.

Hence, the researcher analyzed the collected data using descriptive statistics (frequencies, percentages, mean, and standard deviation) to obtain information on the factors of loan repayment performances especially to summarize and conclude the implications of qualitative data and binary logistic econometric model (logit) was used to analyze the determinants of loan repayment ability of the District borrowers.

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.

$$Yi = \beta 1 + \beta 2 Xi + \varepsilon i$$

$$Pi = \epsilon \left(y = \frac{1}{xi} \right) = \beta 1 + \beta 2 Xi$$

The cumulative Logistic distributive function can then be written as:

$$pi = \frac{1}{1 + e^{-(\beta 1 + \beta 2)}} = \frac{e^{zi}}{1 + e^{zi}}$$

$$where, Z_i = \beta_1 + \beta 2 X_i$$

$Pi = prob(Y = 1| X)$ is the response probability. The non-response probability (1- Pi) is also evaluated as:

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

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

Note that the response and non- response probabilities both lie in the interval [0, 1]; Z_i ranges from - ∞ 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 $\frac{pi}{1-pi}$ and its log-transformation.

$$\frac{pi}{1 - pi} = \frac{prob(yi = \frac{1}{xi})}{prob(yi = \frac{0}{xi})} = \frac{1 + e^{zi}}{1 + e^{-zi}} = e^{zi}$$

$$Li = \ln\left(\frac{pi}{1-pi}\right) = zi = \beta1 + \beta2\, xi \qquad \text{(Gujarati, 2004)}$$

Li 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 Pi 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.

LRP =β1 + β2(Gedr) + β3(Ag) + β4(Mar) + β5(Educ) + β6(Hhs) + β7(Exp) + β8(Othbus) + β9(Busfrm) + β10(Bussctr) + β11(Income) + β12(Lnamt) + β13(Div) + β14 (Eq) + β15 (Grprd) + β16 (Folup) + β17 (Coll) + β18 (Int) + β19 (KYC) + β20 (Timhzn) + β21 (Mrkt) + β22 (Wthr)

Where LRP, Gedr, Ag, Mar, Educ, Hhs, Exp, Othbus, Busfrm, Bussctr. Incm, Lnamt, Div, Eq, Grprd, Folup, Coll, Int, KYC, Timhzn, Mrkt, Wthr denotes Loan Repayment performance, Gender, Age, Marriage, Education, House hold size, Experience, Other business, Business form, Business sector, Income, Loan size, Diversion, Equity, Grace period, Follow up, Collateral, Interest, Kyc, Time horizon, Market and Whether respectively.

β₁ = an intercept, Where β2, β3, β4, β5, β6, β7, β8, β9, β10, β11, β12, β13, β14, β15, β16 β17 represent estimated coefficient

On the other hand, binomial logit regression model of regression was used for econometrical or statistical analysis of the study. The statistical analysis of model with qualitative dependent variables can be viewed as

the problem of predicting probabilities for the various possible values (responses) of the dependent variable. Probit and Logit are well-known techniques for the case when there are only two responses, typically the occurrence or non-occurrence of some event. Both have essentially the same interpretation - the probit is based off an assumption of normal errors and the logit off of extreme value type errors. The logit has slightly fatter tails than the probit possibly making it slightly more robust. In binary studies probit and logit are largely undifferentiated.

In this research, the researcher selected logit model because it is slightly easier to introduce random parameters to and estimate as a simulated maximum likelihood regression. Even though, both have simple and fairly elegant representations in the binary case on paper, in cases of choice with more than two alternatives the logit quickly becomes the preferred choice as the probit model is difficult to estimate when alternatives are above 3. So, logit was used to present the econometric results and analysis of the research.

Odd ratios were used to explain the degree of influence of variable. Odd ratio/ logistic regression coefficients provide information on the probability of being on time payer and default as we change the independent variable by on unit reference to on time payer category

Furthermore, Likelihood Ratio (LR) Chi-Square test used to show that at least one of the predictors' regression coefficients was not equal to zero in the model than the observed statistic under the null hypothesis; the null hypothesis was that all of the regression coefficients in the model are equal to zero. To see the significant of each explanatory variable t- test was applied. Whereas to detect the presence of violation on basic classical linear assumptions of the model, different techniques were applied regards autocorrelation, multicolinearity, hetroschedasticit and normality test.

3.8. Variables of the Study

In order to achieve the extracted objectives of this research, the researcher selected different variables based on literatures that could affect the dependent variables either positively or negatively. Hence, based on availability of data the variables selected in this research are to signify the loan repayment performance and the variables which are attributable and likely to influence the dependent variable were listed down with their respective expected sign.

Selection of variables was based on empirical literature review as presented under the preceding section to establish the factors affecting loan repayment performances. While guided by the literature review, the

researcher also considered other factors likely to influence loan repayment. To establish the factors affecting loan repayment, the researcher summarizes these variables under four broad categories, (i) variables that are related to the characteristics of the borrowers, (ii) factors related to the lending institution (the bank), (iii), factors related to the business/project itself and (iv), factors emanated from the external environments.

3.8.1. The Dependent Variable

The dependent variable of the study is *loan repayment performances*. Loan repayment performance (LRP) is the ability to repay the loan as per the loan agreement and/or inability to repay the loan by either failing to complete the loan as per the loan agreement or neglect to service the loan. Several African studies on loan repayment performance have estimated the factors of loan repayment performance with a binary loan outcome – defining borrowers as either current on their loan repayments or in default. There are a number of different factors that would affect this dependent variable either positively or negatively.

Dependent variable defined

Taking in to consideration the loan status classification by national bank of Ethiopia, according to the loan manual of Development bank the dependent variable of this study loan repayment performances is dummy variable and all other independent variable are encoded as dummy as well as categorical explanatory variables, which is appropriate to use STATA software in the following form. Hence, the study has encoded both dependent and independent variables in the following way by taking in to consideration of being dummy and categorical variable.

Loan repayment performances – encoded as dummy as follows;

1. Pass: due date less 90 (ninety) days

2. Special Mention: due date 90 days" $\leq Y < 180$ days   Performing loan ……..… 1

3. Substandard: due date 180 days" $\leq Y < 360$ days

4. Doubtful: due date 360 days" $\leq Y < 3$ year   Non performing loan …….. 0

5. Loss: due date 3 years $\leq Y$

3.8.2. Definition and Hypothesis on Independent Variables

Selection of variables was based on empirical literature on the factors affecting loan repayment performances. While guided by the literature review, the researcher also considered other factors likely to influence loan repayment. To establish the factors affecting loan repayment, the researcher summarized variables in to four categories, factors related to characteristics of the borrowers, factors related to lending institution, factors related to the nature of the business/project and other external factors. So, dependent variable (loan repayment performance) is expected to be explained by the following independent variables:

3.8.2.1.Factors Related To Characteristics of the Borrowers

These factors are very personal and attached to the behavioral attributes or personal integrity of the borrower. Such type factors are many in numbers; the followings are some to be evaluated under this research;

Gender: determines whether male or female borrowers perform better than the other. It is a dummy variable taking, 0 for female and 1 for male. The female borrowers 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.

Age: age of borrower in years. It is a continuous variable but rearranged as 1) young age (15-30) 2) mature age (31-50) and 3 old age (above 51). It is argued that older borrowers are wiser and more responsible than younger borrowers. On the other hand younger borrowers are argued to be more knowledgeable and more independent. That means on the other way round, the older person may have a lot of experience on business, which may lead to loan repayment, and the younger one may have limited experience attributed to his age and this may lead to loan repayment. Hence, age contribution to loan repayment performance cannot be predetermined.

Marital status: this variable evaluates whether single, married or divorced borrowers showed any difference in repayment performances. It's generally believed that marriage brings stability to once life and equips how to act towards something responsibly. It is a continuous variable but rearranged as a dummy variable; taking 1 if the borrowers are single, 2 if married and 3 if the borrowers are divorced/widowed. 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: generally education is among the primary tools that has transformed the world order as it stands today. Education improves once performance quality. Higher educational levels enable borrowers to

comprehend more complex information, keep business records, conduct basic cash flow analysis and generally speaking, make the right business decisions. So, it is important to test whether education level difference between and among borrowers have brought any change in their loan repayment performances. This is a continuous variable but arranged as categorical variable, taking 1 if the borrowers have no formal education, 2 where the borrowers attended primary educational, 3 if borrowers attended secondary educational and 4 if the borrowers attended college/university education. This factor is expected to have a positive impact in loan repayment performance, because higher educational levels enable borrowers to comprehend more complex information, keep business records, conduct basic cash flow analysis, and make the right business decision. Hence borrowers with higher levels of education may have higher repayment performances.

Family size: this variable is all about the number of dependents on the borrower. Hence, using this variable comparison is made between borrowers having small family size with those having medium or large family numbers against their loan repayment performances. It is a continuous variable(measured in number of members of farm family but arranged as 1 for small family size(1-3) 2 for medium family size(4-5) and 3 for large family size(above 6); it is assumed that the larger the family size the negative influence on loan repayment performance which is attributed to higher house hold expenses. There is a possibility of loans diverted to unintended purposes because of many responsibilities resulting from meeting the needs of many members of the family. Hence borrowers with large family sizes may have lower repayment performances.

Credit Experience: it is a continuous variable but rearranged as dummy taking 0) where borrower have no any credit experience and 1) if borrower have credit experience. Borrowers who have been in business longer are expected to be more successful with their enterprise. They have more stable sales and cash flows than those who have just started. Thus, those who are more experienced will have high repayment rates. Hence, it is expected that experience will positively affect loan repayment performance of borrowers.

3.8.2.2.Factors Related To Lending Institution

These factors are mainly related to technical capacity and strength and/or weakness of lending institution in providing credit services to its borrowers particularly in screening, appraising, approving, supervising and collecting loans from their borrowers.

Loan size: It is the amount of money permitted for the borrowers. In case, the amount of money permitted/lent to borrowers have any influence or not was evaluated using this variable. In order to operate

the investment with its full capacity and cover all necessary costs, sufficient amount of money is required. Von Pischke (1991) noted that efficient loan sizes fit borrowers' repayment capacity and stimulate enterprise. If amount of loan released is enough for the purposes intended, it will have a positive impact on the borrower's capacity to repay. If on the other hand the amount of loan exceeds what the borrower needs and can handle, it will be more of a burden than help, thereby undermining repayment performance. Also positive or negative sign may be expected if the loan is too small. If the loan is too small it may be easy to repay such loans thus enhancing performance (i.e. positive sign). However, too small loan may not bring commitment on borrowers to use the loan productively (Von Pischke, 1991). It may also encourage borrowers to divert the loan to other purposes, increasing credit risk and undermining performance, in which case a negative sign for the variable is expected (Vigano, 1993). It is continuous variable but re arranged as 1 if the amount is from 1-10 million, 2 if the amount is from 11- 20 million and 3 if the amount is above 21 million birr.

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.

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. Grace period is a dummy variable, 0) if sufficient grace period is not given and 1) if sufficient grace period is given to the project. The expected sign of grace period to nonperformance/defaulting is negative.

Know Your Customer/Due diligence (KYC): It is a screening stage evaluation of the borrower and the business whether it is creditworthy or not. It is an entry point assessment. Conducting proper due diligence is require in every applications to access credit from Development bank of Ethiopia. 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. Know Your Customer/Due diligence (KYC) is a dummy variable that well done due diligence taking as 1 and otherwise 0. Therefore, adequate due diligence, the expected sign for being default is negative.

Lending Interest rate: It is a dummy variable taking 1 if increase in interest rate negatively affected repayment performance and 0 if otherwise. Increase in lending interest rate, increases the amount of loan to be repaid per installments. Hence, it is expected to have positive relation with the default.

Timeliness/time horizon: Timeliness of release of loan (measured as a dummy, 1 for loans released at the right time and 0 for loans not released at the right time). Investments in DBE Jimma District area were predominantly, farming activities which is mostly seasonal and rain fed, hence if the loan is not released at the right time yield will be affected and repayment performances may below. Johnson and Rogaly (1997) noted that timeliness of loan disbursement is important when loans are used for seasonal activities such as agriculture. They argued that complicated appraisal and approval procedures, which might delay disbursement, influence a program of seasonal loans for farmers who use to buy inputs. Further they noted that this could in turn worsen the prospects of repayment by diverting loan to non-intended purpose. In such cases a positive sign is expected.

Collateral: Collateral is the guarantee for repayment performances. If the borrower secures high valued collateral relative to the loan size, the lender may feel that it will not be a loser in case the borrower defaults. Borrowers exert their maximum effort to repay the loan if the collateral towards the loan size is high and vise versa. Collateral is dummy variable taking 0) if sufficient collateral is not attached for the loan and 1 if the collateral is sufficient to restore the lent money in case of default. So, collateral will have positive sign towards repayments of money.

Equity: For this research purpose equity is the share of borrowers in the total investment capital of a project. The amount of equity of owners in the investment determines the sense of belongingness and the extent of responsibility. If the amount of equity is higher, the borrower feels a sense of ownership and will strive to recover the loan and make the whole asset his sole property. Equity is a dummy variable taking 0 if equity less or equal to 30 percent of total investment and 1 if the equity is greater than 30 percent of total investment. Thus, a positive sign is expected.

Loan diversion: Diverted loans miss the targets of the investments. The projects will not generate necessary earning and benefits to repay loans if loan diverted. According to Abraham (2002), loan diversion is problematic only if the business which received the diverted money fail to pay back. But the loan manual of DBE prohibits any kinds of loan diversion. Loan diversion is a continuous variable but arranged as dummy variable taking 0) if not diverted and 1) if diverted. So, loan diversion contributes positively to default.

3.8.2.3.Business Specific/Project Related Factors

Business Sector; 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. Business Sector is continuous variable but arrange as 1 for agriculture, 2 for service and 3 for industry. The expected sign for agriculture is positive for default.

Other business:-It is a dummy variable taking 0 if didn't have another business and 1 if having another business. It is all about experiencing some other business in addition to the current project that the borrower involved. If the borrower has other source of income, he may not spend the income that is generated from the current business other than loan repayment, or vice versa. It was expected positive or negative sign because if the promoter has additional business other than the project, he or she will divert loan and expend more time on other business. On the other hand, borrower who has other business might use it as the source of short fall of capital or loan repayment.

Business form: The ownership and the level of responsibility of the business matters in operating any business. Whether the ownership was sole proprietorship or PLC or other business form, because some form of business leave individual responsibility and accountability may cause for business failure and hence low repayment performance. It is continuous variable but rearranged as 1 if sole owner 2 if PLC and 3 if SHC and others.

Income/profit: it is dummy variable taking 0 if sufficient income is not generated and 1 if sufficient income compared to feasibility study is gained from the business. Income/profit is amount of money generated from the business itself with a given fiscal year. Hence the sign it takes may not be single, because if sufficient income is generated the variable shows positive sign to repayment and otherwise.

3.8.2.4.Other Factors (Macroeconomic Factors)

Market conditions (inflations): this is dummy variable taking 0 if market condition didn't affected repayment and 1 if market condition affected repayment of the borrower. In contemporary world the market condition is unpredictable. There fluctuation from time to time, hence, shows negative sign to repayments of loan.

Whether conditions: this is dummy variable taking 0 if whether condition didn't affected repayment and 1 if whether condition affected repayment of the borrower. Now days the global whether condition is threatening the life of human beings. El Niño for instance, caused some unpredictable and unbelievable disasters in the last year. So, shows negative sign towards repayments of loan.

Explanatory variables encoded

Explanatory variables are encoded as dummy and categorical variables as follows;

1. Gender …………………………......male= 1 and otherwise = 0

2. Age ………………. 1= Young age (15-30) 2 = mature age (31-50) 3= old age (51 above)

3. Marital status ……………. Single = 1 married = 2 divorced/widowed = 3

4. Family size --------------------- small = 1 medium = 2 large = 3

5. Education level …….. 1= no formal educ. 2= primary educ. 3= tertiary educ. 4 = coll/above

6. Other business ………………....Have other business = 1 and not have other business = 0

7. Experience ------------------------ if yes = 1 and if not = 0

8. Loan size ……………… small (1-10m) = 1 medium (11-20m) = 2 large (21 above) = 3

9. Kyc/due diligence …………….. If properly undertaken =1 if not = 0

10. Business sector ………………...Agriculture = 1 and service = 2 Industry =3

11. Business form ………………. Sole owner = 1   Plc. = 2 and SC and others = 3

12. Equity …………….. Equity greater than 30 percent = 1 and less/equal to 30 percent = 0

13. Time horizon……………………….timely = 1 delayed = 2 and too late = 3

14. Loan diversion ------------------- if diverted = 1 and if not = 0

15. Collateral …………………....sufficient collateral = 1 and not = 0

16. Grace period ……………….. Sufficient time given = 1 and if not = 0

17. Follow up …………………... proper follow up = 1 and if not = 0

18. Lending interest rate ………......change in interest rate affected repayment = 1 and if not = 0

19. Income/profit --------------------- if sufficient income generated = 1 and if not = 0

20. Market condition ……………..Poor market condition = 1 and were not poor = 0

21. Weather condition …………....Bad weather condition = 1 and were not bad = 0

To sum up, discrete dependent variable (loan repayment performance) was expected to be explained by listed discrete and categorical independent variables with their sign as shown in the table 3.1.

Table 3. 1summary of Expected Sign (+/-) of Explanatory Variables in this Study

No	Explanatory Variables	Measurement	Definition	Expected Sign
1	Age	Categorical(young, mature, old age)	The older the age having high experience contributes a lot for loan repayment	+
2	Gender	Dummy, male & female	lending to women, lead to high loan repayment rates	+/-
3	Marital status	Categorical(single, married and divorced/widowed)	Married borrowers can take great care than non-married for default	+/-
4	Education	Categorical (no educ, primary, high school, coll.)	Being literate borrowers well informed and contributes for default negatively	+
5	Credit Experience	Dummy,(yes or no)	borrowers who have no or less experience, will contribute for default	+
6	Household Size	Categorical(small, medium and large family)	The smaller family size less probability being default	-
7	KYC	Dummy(properly made and otherwise)	performing due diligence thoroughly less probability being default	+
8	Follow up	Dummy(yes or no)	Performing fledged follow up as per the schedule the probability of defaulting is less	+
9	Business Sector	Categorical (agriculture, service and industry)	agricultural projects are seasonal, the rate for default so high	-
10	Equity	Dummy (less than thirty percent or above)	The larger the equity of owners, the less the probability of being default.	+/-
11	Time horizon	Categorical(timely, delayed and too late)	disburse the loan timely, less probability being default	+/-
12	Grace Period	Dummy(sufficient time given or otherwise)	large grace period is given for projects, less probability being default	+
13	Collateral	Dummy (sufficient grantee provided or not)	When bank loan provided with sufficient collateral, the probability of being default decrease.	+/-

14	Income/ Profit	Dummy (sufficient income or otherwise)	The more the profitability of projects, the less the probability of being default.	+
15	Loan size	Categorical(small, medium and large)	Increasing loan size ,increasing capital , generates revenue, less probability being default	+/-
16	Loan diversion	Dummy (loan diverted or not)	Diverted loan miss the target, hence probability of being default is high	-
17	Other business	Dummy (whether the borrower have another business or not)	Other business may help to repay or be a source of diverting loan; so the probability may depend on scenarios.	-/+
18	Business form	Categorical (sole owner, plc and Shc)	Some business form limit the liability of owners, probability of default is high in such cases.	-
19	Interest	Dummy (increase of lending interest affect or no)	Increase in lending interest rate increases the probability of being default	-
20	Whether	Dummy (product affected by whether or not)	If whether condition was not normal in the probability of being default is high.	-
21	**Market**	**Dummy(the price of products affected by market or not)**		+

Source: compiled from the definition and literatures, 2017

3.9.   Conceptual Framework

According to Shields (2013), a conceptual framework was expressed as the way ideas are organized to achieve a research project's purpose. It is connected to the research purpose.

A conceptual framework is a basic structure that consists of certain abstract blocks which represent the observational, the empirical and the analytical/ synthetically aspects of a process or system being conceived. The interconnection of these blocks completes the framework for certain expected outcomes.

Hence, the researcher developed the following conceptual framework to easily assess the relationships between those factors and loan repayment performances. In addition to methods of data presentation and analysis, the research frame work has described in the following diagram considering both explained and explanatory variables. Thus, the simple diagram shows the effect of explanatory variables (borrower side, lender side, business side and external) of loan repayment performance of borrowers. This conceptual frame

work was developed based on literatures reviewed under previous chapter and the variables selected under this chapter of this study.

Figure 2. 2 **Conceptual framework**

Borrowers specific factors
Age,
Gender,
marriage,
Family size,
Experience,
Education

Business specific factors
*Income,
*other business,
*business form,
*business sector

Loan Repayment Performances

Bank specific factors
*Follow Up,
*Grace Period,
*Loan Size,
*Diversion,
*Equity,
*Collateral,
*Time Horizon,
*Kyc And
*Interest.

Other external factors
*Whether condition
*Market condition

Source: Prepared by the researcher.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

Introduction

This chapter reports the results of the study conducted to identify the factors affecting loan repayment performances. The data collected from survey questionnaire were carefully coded and checked for consistency and prepared for analysis and interpretations. The analysis was performed using descriptive statistics and with the help of stata. Therefore, this chapter presents analysis of the result and discussion to achieve research objectives based on data obtained from the questionnaire respondents and interview made with senior staffs and managers.

The first section of this chapter discusses the back ground of respondents followed by the result of descriptive statistics of explanatory variables. In this part of analysis, factors of loan repayment performances included under four categories (borrower related, business related, lender related and external related) and other challenges of borrowers which affects repayment performance were analyzed by using descriptive statics like percentiles, means, standard deviation and frequency. Besides, the second section discusses the econometrics result of binary logistic & the analysis of significant variables.

4.1. Background Information of Respondents:

Questionnaire response rate and interview success rate: The questionnaire was distributed to a population selected using stratified random sampling. Accordingly, there are two groups of population, performing loans (borrowers) and nonperforming loans (borrowers), 110 and 40 respectively. Out of the one hundred fifty questionnaires physically distributed to the target population, one hundred fifty usable responses were collected. This represented a response rate of 100 percent and implies there is no unreturned questionnaire.

Out of the ten projected interviews, nine of them were successfully conducted, giving a success rate of 90 percent. The left interviews was unsuccessful due to the targeted interviewees were time constrained. Despite this, the target population was fairly represented considering that managers who are relevant to the study were interviewed. The results are shown in table 4.1 below.

Table 4. 1 Questionnaire and interview success rate

	Target respondents	Actual respondents	Success rate
Questionnaire	150	150	100%
Interview	10	9	90%

Source: Own computation from primary data, 2017

4.2. Descriptive Analysis

The descriptive statistics for dependent and independent variables are presented below. The dependent variable of the study is loan repayment performances and measured by performances of loans and/or nonperformance of loans/impaired loans. Scholarly literatures presented under chapter two of this work, classified the factors affecting loan repayment performances in to four broad categories. Customer/borrower related factors (include age, gender, experience, family size and education level of the borrower), lender institution related factors (includes loan size, time horizon, Collateral, equity, follow up and grace period), business related factors (such as having other business, business form, business sector, business income,) and finally eternal factors (like market problem, weather condition and others). The detail descriptive and discussions were presented for every individual factors under all these groups.

As discussed under sampling techniques in previous chapter, the total population of the study was 273, out of which 217 were performing loans and the remaining 56 were non-performing. Using stratified random sampling techniques 150 population were selected for this study purpose and 110(73.3%) were performing loans (according to loan status classification it includes pass, special mention and substandard) and the remaining 40(26.7%) were nonperforming loans (doubtful and loss status). From this we have loan repayment category of performing and Nonperforming/defaulters. In presenting the descriptive statics analysis of the variable, in addition to percentage and frequencies, 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.

4.2.1. Borrowers Related Factors

To begin with, borrower's specific factors are the first most important factor related with personal characteristics of the borrower and it's important in determining performing and nonperforming loans based on the personal behavior of the borrower. Under this research, gender, age, marital status, education level, credit experience and family size were identified to evaluate their contribution in loan repayment performances of the borrower. From among these variables, gender and credit experience were encoded as dummy explanatory variables whereas age, marital status, education level and family size were encoded and treated as categorical explanatory variables. So, now let us see all discrete and categorical variables from loan repayment performances perspectives.

Gender of Borrower: There is a belief among many credit analysis/specialists that female are better payers than male borrowers, taking into consideration of their being more entrepreneurial that results from assuming more responsibilities in the internal affairs of a household. (Vigano, 1993) Also Khanker et al. (1995) explains that loan recovery rates have been higher for women than for men.

Table 4.2 below shows the relationship between genders of borrowers with their repayment performances. In terms of gender composition, from the total 150 survey population of the study the super majority of them 137(91.3%) were male borrowers. The detail information is presented in the table below.

Table 4. 2 Gender in repayment performances.

Explanatory Variable	Repayment performances			X2 value
	Performing	Defaults	Total	
Male	99	38	137	
	72.3	27.7	100%	
Female	11	2	13	X2 = 3.2603
	84.6	15.4	100%	
Total	110	40	1500	P = 0.071
	73.3	26.7	100%	

Source; computed based on own survey, 2017

The table revealed that the number of female borrowers is much lesser than male. Accordingly, Out of the total respondents, 137(91.3%) were male and 13(8.67%) were female. More specifically Out of the total male sample respondents, 72.3%, and 27.7% of male respondents were non-defaulted and defaulters, respectively. Whereas 84.6% and 15.4% of female respondents were non-defaulters and defaulters, respectively.

This reveals that from their respective sex composition, females' respondents were found having more repayment performance than male respondents. Accordingly, Female borrowers generally delight in the hard work ethics and the culture of financial discipline in repaying their loan and being committed to the contractual agreement. The chi-square result also shows that the association between sex and loan repayment is significant (X2=3.2603, at P=0.071) table 4.2. This indicates that female borrower had strong positive relation to loan repayment performances.

Age: is one of the independent variables related with borrowers' characteristics and determined loan repayment performance of the borrowers. The survey results revealed that from total respondents 54(36%) were at their young age/less than the age of 30 years, 62(41.33%) respondents were at their maturity age/ranging 31-50 years and the reaming 34(22.67%)respondents were old/above 60 years old. The age distribution of borrowers shows no significant difference as the number of one group is not that much greater than the remaining.

Performance wise, from total young age borrowers 70.4% were the non-defaulters and 29.6 % were defaulters. From mature age borrowers 67.7% respondents were the non-defaulters and 32.3% were defaulters. From old age group of population 88.2% respondents were the non-defaulters and 11.8% were defaulters.

Table 4. 3 Age and marital status of Borrowers and Loan Repayment

Variables	Category	Frequency	Non- Defaulter		Defaulter		Total	
			N	%	N	%	N	%
Age of respondent	Less than 30 years	54	38	70.4%	16	29.6%	54	36%
	31-51 years old	62	42	67.7%	20	32.3%	62	41.3%
	Above 60 years old	34	30	88.2%	4	11.8%	34	22.6%
Total		150	110		40		150	100%
Marital status	Single	61	43	70.5%	18	29.5	61	40.7
	Married	81	61	75.3%	20	24.7	81	54
	Divorced/widowed	8	6	75%	2	25	8	5.3%
Total		150	110		40		150	100
Experience	Have Credit experience(1)	85 (56.7%)	68	80%	17	20%	85	100
	No credit experience(0)	65 (43.3%)	42	64.6%	23	35.4%	65	100
Total		150	110	73.3%	40	26.7%	150	100

Source; computed based on own survey, 2017. N=number of respondents

The survey revealed that as the age of borrowers increases the probability of defaulting decreases and the repayment performances increases. This emanates from the logic that as age increases the knowledge, experience and skills of handling and administering businesses and thereby credit management enhances, hence, the probability of defaulting decreases.

Marital status of borrowers**:** Regarding the marital status of the borrower's, out of the 150 sample borrowers, as depicted on table 4.2, 40.67%, 54%, and 5.3% respondents were single, married, and divorced respectively. The single respondents were accounts for non-default and default 70.5% and 29.5%. Married respondents were 75.3% and 24.7% non-defaulter and defaulter respectively. Among of Divorced respondents, 75% non-defaulters and 25 defaulters. This indicated that compared to single borrowers married and or divorced borrowers were better in paying their credit. The reason may related to the social responsibility level of married and divorced borrowers. This result is same with the result of Josephat, et al. (2013), Wongnaa1, et al, (2013)

Credit Experience: Another borrower related factor is credit experiences of respondents. The credit experience of respondents shall be expressed in terms of years or months, hence it is a continuous variable, but rearranged and encoded as dummy variable taking 1 if credit experience exists and o otherwise. Credit experience helps borrowers in utilizing the loan for intended purpose and on how to prepare payments as per the schedules.

Coming to survey results, From table 4.3 out of the total respondents majority of them 85 respondents or 56.7% of total borrowers have credit experience and 68(80%) of these experienced borrowers were paying their loan as per the schedule of the contract, while the remaining 17 respondents or 20% were defaulted. On the other hand, 65 respondents or 43.3% were completely new for inexperienced and did not have any experience. Out of such borrowers 42 respondents, i.e. 64.6% were performing loans and 23 respondents i.e. 35.4% were nonperforming loans. So, experienced borrowers are better in repaying their loan than those who didn't have any experience.

However, the chi-square result shows that the association between marital status and experience and the dependent variable loan repayment is insignificant. This indicates that being either in any marital status doesn't statistically determine loan repayment.

Education: The survey on the educational characteristics of the borrowers shows that 22 (14.67%)of the borrowers didn't attended any formal education, some 53/35.33% borrower attended lower level/primary education, the rest 48(32%) and 27(18%) of the borrowers attended secondary school or tertiary level and joined college or university respectively as shown in table 4.4.

The loan repayment performance of the borrowers relative to their educational level as shown on table 4.4 showed that among 22 borrowers who do not have formal education 40.9% of them were repaying their loan successfully whereas the remaining 59.1% were defaulters. From borrowers whose educational level is at primary level, majority of them 71.7% repaid their loan duly and 28.3% of them defaulted. From 48(32%) borrowers who attended tertiary education, 81.2% of them were non-defaulters while 18.8% were defaulters. Finally, from 27(18%) borrowers who attended college education and above, 88.9% were non-defaulters and the remaining 11.1% were defaulters. This result indicates as education level increases, the probability of defaulting decreases and vice versa. 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.

The chi-square result also shows the presence of strong and significant association between educational level and dependent variable at 1% significance level (X2=66.5646, at P=000). This results of chi square revealed that level of education has strong and significant relationship with the dependent variable.

Table 4. 4 Educational Qualification and family size of Borrowers and Loan Repayment

Variables	Categories	Non-Default		Default		Total		Chi square
		N	%	N	%	N	%	X2=66.5646
Educational Qualification	No formal education	9	40.9%	13	59.1%	22	14.67%	P=0.000
	Primary education(1-8)	38	71.7%	15	28.3%	53	35.3%	
	secondary education(9-12)	39	81.2%	9	518.8%	48	32%	
	College and above	24	88.9%	3	11.1%	27	18%	
Total		**110**	**73.3%**	**40**	**26.7%**	**150**	**100.0%**	
Family size	Small	46	76.7%	14	26.3%	60	40%	X2=6.8306 P=0.033
	Medium	43	81.1%	10	18.9%	53	35.3%	
	Large	21	56.8%	16	43.2%	37	24.7%	
Total		**110**	**73.3%**	**40**	**26.7%**	**150**	**100%**	

Source; computed based on own survey, 2017. N= number of respondents

Family size: In this study family size is used to express the number of dependents on the borrower. Accordingly, the influence of family size on repayment performances of borrowers is assessed as follows; out of the total sample borrowers, 60 of them have small family size and the repayment performances of small size household is 26.3% defaulted and 76.7% non-defaulted. The other 53 borrowers were having medium size family, out of which 18.9% of them were defaulted and the remaining 81.1% non-defaulted. Lastly, 37 borrowers were responded having large family from which 43.2% defaulted and 56.8% non-defaulted. The statistical survey from the above table showed as family size increases the likelihood of being default increase and vice versa.

The regression result of chi-square shows presence of strong and significant relationship between family size level and dependent variable at 5% significance level (X2=66.5646, at P=000). This results of chi square revealed that increase or decrease in family size has strong and significant relationship with the dependent variable.

4.2.2. Business Related Factors

Respondents were found to engage in various business sectors. For this study purpose the most important businesses are categorized in to three sectors namely agricultural type businesses, service type business sector and industry type business. The other source of factors that affects loan repayment performances, emanates from the business itself. That is, among the group of factors affecting loan repayment performances, business related factors were another important factors in determining what factors were affecting performing and non-performing loans. Thus, in this research business form, business sector, other business and business income are selected as business related factors. Out of which business form and business sector were encoded as categorical explanatory variables whereas other business and business income were encoded and treated as dummy explanatory variables of loan repayment performance.

Business sector: this variable evaluates which economic sector from agricultural, service and industrial sector of the economy affects loan repayment performances of the borrowers. As discussed under chapter two of this study, literatures show that agricultural investments are vulnerable to different natural and manmade problems than other projects.

With respect to the business sector on which loans were invested out of the total 150 sample populations majority of them were agricultural projects. Located in the south western direction of the country Development Bank of Ethiopia Jimma district and surrounding areas were conducive for agricultural investments. As such, out of 150 respondents participated in the questionnaire of this research, 108 or 72% of them were invested on agricultural projects. Compared to the remaining two economic sectors, agricultural investments are dominated the loans of the district and the role of the sector determines the performances of the district as a whole.

The repayment performances of agricultural loans as shown in table 4.5, below 72 borrowers or 66.7% of sample respondents took the loan to engage in agricultural type business, whereas, 32 or 21.3% invested on service investments and 10 borrowers or 6.7% took the loan to invest on industrial sector of the economy. Now, out agricultural loans 66.7% were performing and of them or 33.3% of them were nonperforming. On the other hand, from among loans invested on service sector of the economy, 90.6% loans were performing and 9.4% were nonperforming loans. The loans invested on industry sector indicate that 90% or 9 performing and the remaining 10% or 1 loan was non-performing loans. As the table depicted, the agriculture sector

showed that the percentage of default higher than service and industry sector. In same line research, Besley and Coate (1995) reveal that agricultural loans were risky and the probability of high loan default.

Table 4. 5 Business sector and business form against repayment

Explanatory Variable	Loan repayment performances				Chi square
	Category	Performing	Non-performing	Frequency	
Business sector	Agriculture	72	36	108	X2 = 10.0736
		66.7%	33.3%	100%	
	Service	29	3	32	P = 0.006*
		90.6%	9.4%	100%	
	Industry	9	1	10	
		90%	10%	100%	
Total		110	40	150	
		73.3%	26.7%	100%	
Business Form	Sole owner	62	7	69	X2 = 25.2614
		89.9%	10.1%	100%	P = 0.000*
	PLC	33	30	63	
		52.4%	47.6%	100%	
	SC	15	3	18	
		83.3%	16.7%	100%	
Total		110	40	150	
		73.3%	26.7%	100%	

Source: own survey of data, 2017. * = Significant at 1%

The results of the survey as depicted in the above table showed that agricultural sector as compared to others sectors has contributed 80% of nonperforming loans of the bank. The main reasons of lion share contributions of agricultural investments in the nonperforming loans emanated from the nature of rain fed agriculture. Rain fed agricultures are basically dependent on the natural factors like rain, drought and many others. Statistically, chi-square also confirms the presence of strong and a significant association between business sector and dependent variable at 1% level of significance (X2 = 10.0736, at P=0.006). This shows that

business sectors, especially agricultural loans have strong negative relationship with that of dependent variable.

Business form: Ethiopian commercial law recognizes different types of business form having their unique features. Share companies, Private limited companies, cooperatives, and different kinds of partnerships are widely used forms of business in our country. Among many different features of business forms, one distinguishing feature is the level of responsibilities the owners share in cases of debt recovery.

Borrowers of DBE, were categorized under three business forms; sole proprietorships, private limited companies and share companies. Based on the results of the survey indicated in the above table, 69 borrowers or 46 percent of the sample population were sole owners/ private borrowers of their business, while 63(42) borrowers were Private Limited Company(PLC) and the remaining 18 or 12% of borrowers were Share Companies.

In terms of their Loan repayment performances, from total private borrowers/sole owners as shown in the table, 89.9% of them were performing loans and 10.1% were nonperforming. In cases of Private Limited company borrowers, 52.4% were performing loans while the remaining 47.6% were nonperforming loans. Lastly 83.3 % and 16.75 were performing and non-performing loans respectively in case of Share Company.

Maximum numbers of performing loans were found in private borrowers/ sole owners' business form and service and industry business sector. Based on row relative frequency of business forms and business sectors, maximum numbers of defaulters were found in private limited company business form and agriculture business sector, respectively. Maximum numbers of defaulters were from private limited company business form and service business sector. The researcher believes that the reason why greater number of defaulters are from private limited company is related to the level of responsibilities the shareholders bear in cases of failure to repay the debt of the company. This result is the same with Arega Seyoum(2016). The regression result of chi square also confirms the presence of strong and a significant association between business form and dependent variable at 1% level of significance (X2= 25.2614 at P = 0.000). This shows that business form very specifically Private limited Company's loans have strong negative relationship with that of dependent variable.

Having another business: this variable is designed to evaluate the exposure, awareness and familiarity of borrowers to operate the current business and whether such exposure and experience helps them in repayment performances of their loan.

Accordingly, the survey result of the study as depicted on the table 4.6, out of total sample borrowers only 66 borrowers or 44% have other business and 88 borrowers or 56% of them didn't have any other business prior to the current project/business established with help of Development Bank of Ethiopia. The repayment performance statistics as tabulated in the table below shows that out of those borrowers having other business 50 borrower's or 75.8% have performing loans and the left 16 borrowers or 24.2% were defaulted. Likewise out of those borrowers having no other business 60 borrowers or 71.4% were paying their loan as per the schedule of their contract with the lending bank, while the remaining 24 borrowers or 28.6% were defaulted. Obviously, this result shows that having other business contributes to repay the loan as per the schedule of the contract whereas having no other business contributes to fail to repay the loan. Similarly, the chi-square result reveals the strong and significant association between having other business and loan repayment at significant level 5% (X2=25.8248, at P = 000). This implies that having business experiences enhances the probability to repay loan more than no business experience.

Table 4. 6 other business and income vs. loan repayment performances

Explanatory variable	Frequency	Loan repayment performances			
		Performing Loan	Nonperforming Loan	total	
Have Other business(1)	66	50	16	66	X2= 25.8248
	44%	75.8%	24.2%	100	
Have no other business(0)	84	60	24	84	P = 0.000*
	56%	71.4	28.6	100	
Total	150	110	40	150	
		73.3	26.7	100	
Income generated Sufficient(1)	61	43	18	61	X2 = 0.4219
	40.7%	70.5%	29.5	100	
Not sufficient(0)	89	67	22	89	P = 0.516
	59.3%	75.3	24.7	100	
Total		110	40	150	
		73.3	26.7	100%	

Source: own computation of data, 2017. * Significant at 1%

Income/ profit generated from the project is a continuous variable, in this study it was rearranged as dummy variable. It is generally believed that if a business generated sufficient income/profit, the probability of repayment performance is high and vice versa. So, based on the results of the survey from the above table 4.6, 67 borrowers or 44.7% answered their business generated sufficient profit. The left 83 borrowers or 55.3% answered their business did not rewarded them with sufficient income.

Accordingly, among the respondents that generated sufficient income 67 borrowers, 70.5 %(43) were performing while 29.5% (18) were defaulters. From the projects that fail to generate sufficient income 89 borrowers, 75.3% (67) were performing/ non-defaulted and the remaining 24.7% (22) were defaulters. The table showed that projects that have not generated sufficient income/profit expected to repay the loan from the other source of finance otherwise the probability of loan to default is high. Despite most respondents who answered this questionnaire, there were some respondents who left it blank space but they responded. 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). However, the chi-square result shows that the association between income and loan repayment is insignificant (X2= .4219, at P=.516) table 4.6. This indicates that being generating income by itself doesn't determine loan repayment performances.

4.2.3. Institutional Related Factors

Development Bank of Ethiopia is a public financial institution that has been financing for viable projects in line with country's developmental policy and programs. The bank has its own policy and procedural manual for the flow of work that can be used during providing credit services on those feasible projects. There are different factors affecting loan repayment performances while using Policy and procedures of the bank. Among institutional related factors, loan size, loan diversion, sufficient equity, grace period, follow up, collateral, interest rate, KYC and time horizon problems were taken as factors of loan repayment performance.

From these variables, loan size and time horizon were encoded as categorical variables and the remaining were encoded and treated as a dummy variables having their own features. Now, let's discuss the results and present the survey of the data.

Loan size: this is the amount of money the bank permitted for the project and whether the size of such loan determines the repayment performances of loan is assessed as follows. Loan size is a continuous variable to

be expressed in terms of currency or figure but for the purpose of this study it is categorized and coded as (1= 1million-10 million, 2=11 million to 20 million, 3= 21million and above).

From the total respondents 40 borrowers or 26.67% borrowed from 1-10 million birr, 58 borrowers or 38.67% were borrowed from 11-20 million birr and the remaining 52 borrowers or 34.67% were borrowed above 21 million birr. When it comes to repayment performances, out of those who borrowed 1-10 million birr, 27 borrowers, i.e. 67.5% were paying their loan as per the terms of their contract with the bank, and the remaining 13 borrowers, i.e. 32.5% were defaulted. The next respondents were those who borrowed from 11-20 million birr, out of 58 borrowers, 42 of them i.e. 72.4% were performing and the remaining 16 borrowers, i.e. 27.6% were defaulted. Lastly, from 52 borrowers who borrowed 21 million and/or above, 41(78.8%) were performing loans and the left 11 borrowers or 21.2% were nonperforming loans.

Generally, the results of this statistical analysis show that when loan size increases, the probability of default decreased. It can be the fact that an increase in the loan size, 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. The chi-square result reveals the strong and significant association between having loan size and loan repayment at significant level 5% (X2=9.1793, at P = 0.010). This implies that getting sufficient loan amount contributes to repayment performances. 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. 7 loan size and time horizon against repayment

Explanatory variables	Category	Loan repayment performances				
		Frequency	Performing	Nonperforming	Mean	
Loan size	1-10million	40	27	13		X2 = 9.1793 P = 0.010*
		26.67%	67.5%	32.5%		
	11-20million	58	42	16	2.08	
		38.67%	72.4%	27.6%		
	≥ 21 million	52	41	11		
		34.67%	78.8	21.2%		
Total		150	110	40		
		100	73.3	26.7		
Time horizon	Timely	39	37	2		
		26%	94.9%	5.1%		
	Delayed	79	68	11	1.953333	X2 =70.3838 Pr = 0.000**
		52.7%	86.1%	13.9%		
	Elongated	32	5	27		
		21.3%	15.6%	84.4%		

Source: Output from Survey Data, 2017. ** Significant at 1% and significant at %5

Time horizon: this variable assess whether the lending institution deliver its services (includes services like credit team processes, appraisal and approval) within a shortest possible time or otherwise. Time horizon is a continuous variable, but rearranged as categorical variable and encoded as 1 for timely response 2 for delayed services and 3 for elongated services. According to Johnson and Rogaly (1997), timeliness of loan disbursement is important when loans are used for seasonal activities such as agriculture. It's argued that complicated appraisal and approval procedures, which might delay disbursement, influence a program of seasonal loans for farmers who use to buy inputs. Further they noted that this could in turn worsen the prospects of repayment by diverting loan to non-intended purpose.

The survey of data as stipulated in the table above shows that 26% of total population was served within a reasonable time expected from customers, while 52.7% get delayed service and the remaining 21.3 got service after such length dalliance. Out of timely served borrowers, 94.9% were performing their loan, while the 5.1% failed. On the other hand out of borrowers who got service (especially disbursement and approval) after some dalliance, 86.1% were repaying their loan as per the requirements of the bank and 13.9% were defaulted. Finally among those borrowers who got service after lengthy dalliance, 15.6% were performing

and 84.4% were nonperforming. The result from the survey is also backed by statistical chi square. Hence, chi-square result reveals the strong and significant association between time horizon and loan repayment at significant level 1% (X2=70.3838, at P = 0.000).

The statistics results in this survey indicate the fact that getting service within the shortest possible time contributes to well performance and vice versa.

Collateral: this is a continuous variable, but arranged as dummy variable taking 0 if the collateral is sufficient in cases of failure and 1 if the collateral is not sufficient. Lending institutions needs grantee for the money they provide for their customers. The value of such collateral is believed to be more or equal to the amount of money permitted for the borrower. The case is little different in development bank of Ethiopia, because the loan policy of the bank do not require for collateral that is more or equal to the amount of money lent to customers. The only collateral of the bank is the business/project itself, which in some cases particularly in agricultural projects were open fields or empty store.

The table below revealed that, 54.7% respondents believes that the bank has no sufficient mortgage in case the loan defaulted, if the banks go for recovery and the remaining 45.3% believes the bank has sufficient collateral. In terms of performances, out of those who believe the bank has no sufficient collateral, 69.5% of them were performing their duty of repaying their loan and 30.5% were non-performing. From those who believe the bank has sufficient collateral, 77.9% were no defaulted while 22.1 were defaulted.

Equity: is a continuous variable, but encoded as dummy taking 1 where the equity is greater than 30% percent of total investment of the project and 0 when the equity amount is less or equal to 30% percent of total investment cost. Accordingly, from the table below, 76% of equity contribution is less or equal to thirty percent of the total investment cost and 24% were more than thirty percent of the investment.

Further the table revealed that, out of 114 borrowers or 76 % whose equity contribution is less or equal to thirty percent, 66.7% were performing and 33.3 were nonperforming loan. And from those 36 borrowers or 24% whose equity contribution is greater than thirty percent, 94.4% were performing loans and the left 5.6 were non-performing loans. This indicates that the probability of defaulting decreases as equity contribution of borrower increases.

Table 4. 8 collateral, equity and diversion against repayments.

Explanatory variables	Loan repayment performances				
	Frequency	Performing	Nonperforming	Total	
Sufficient Collateral(1)	68	53	15	68	X2= 1.3636
	45.3%	77.9%	22.1%	100	
Insufficient Collateral(0)	82	57	25	82	P = 0.243
	54.7%	69.5%	30.5%	100	
Total	150	110	40	150	
	100	73.3%	26.7%	100	
Equity>30 percent(1)	36	34	2	36	X2 = 0.8485
	24%	94.4%	5.6%	100	P = 0.357
Equity≤30 percent(0)	114	76	38	114	
	76%	66.7%	33.3%	100	
Total	150	110	40	150	
	100	73.3%	26.7%	100	
Diverted loan(1)	8	3	5	8	X2= 4.7944
	5.3%	37.5%	62.5%	100	P = 0.029*
Not diverted (0)	142	107	35	142	
	94.7%	75.4%	24.6%	100	
Total	150	110	40	150	
	100	73.3%	26.7%	100	

Source: Output from Survey Data, 2017. * Significant at 5%

Regarding loan diversion, out of the total sample respondents, 94.7% borrowers were not diverted their loan to other business, but 5.3% respondents diverted their loan from intended business to some other purposes. Out of those who diverted respondents 62.5% was defaulted and 37.5% was performing. And out of those who did not diverted 75.4% were performing and the remaining 24.6% was defaulted. The statistical result of this survey shows that, loan diversion contributes to the probability of defaulting and vice versa. Statistically, chi-square result also confirms that there is strong and significance association between loan diversion and loan repayment at 5% (X2= 4.7944, at P =0.029) could find from Table 4.8.

Table 4. 9 interest rate, grace period, follow up and KYC with repayment

Explanatory variables	Loan repayment performances				
	Frequency	Performing	Nonperforming	Total	
Given grace period(1)	59	44	15	59	X2 = 0.0771
	39.3%	74.6%	25.4%	100%	Pr = 0.781
Not given grace period (0)	91	66	25	91	
	60.7%	72.5%	27.5%	100%	
Total	1500	110	40	150	
	100	73.3	26.7	100%	
Interest rate affected (1)	86	61	25	86	X2 = 0.6001
	57.3%	70.9%	29.1%	100%	Pr = 0.439
Interest rate not affected(0)	64	49	15	64	
	42.7%	76.6%	23.4%	100%	
Total	150	110	40	150	
	100	73.3	26.7	100%	
Proper follow up (1)	41	32	9	41	
	27.3%	78%	22%	100%	
No follow up(0)	109	8	31	109	X2 = 9.4665
	72.7%	71.6%	28.4%	100%	Pr = 0.002**
Total	150	110	40	150	
	100	73.3	26.7	100%	
Proper KYC (1)	70	57	13	70	X2= 4.4836 Pr = 0.034*
	46.7%	81.4%	18.6%	100%	
No proper KYC (0)	80	53	27	80	
	53.3%	66.2%	33.8%	100%	
Total	150	110	40	150	
	100	73.3%	26.7%	100%	

Source: Output from Survey Data, 2017. *Significant at 5% ** significant at 1%

As read from the table, 60.7% respondents said they were not given sufficient grace period so as to begin operation with full capacity and establish itself strongly. Only 39.3% respondents answered their business is given grace period. The business/projects that had no grace period contribute for default and non-default loan

was 27.5% and 72.5% respectively. In the other hand, projects that was given grace period contributes for default and non-default loan was 25.4% and 74.6% 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. But the chi square didn't show the existence of strong and significant relationship between grace period and the dependent variable.

In the same token, increase in lending interest rate also has affected repayment performances. Accordingly, 57.3% respondents answered their repayment capability was affected by increase in the lending interest rate and 42.8% respondents said such increase in interest rate did not affected their repayment capacity. Out of those affected by increase in lending interest rate change, 70.9% were performing their repayment duty as per the schedule arranged in their loan contract, while 29.1% failed to carry on their duty of repayment as per the schedule. From those who did not affected by change in lending interest rate, 76.6% were performing their duty while 23.4% were nonperforming. The statistical analysis of chi square didn't show the presence of any strong and significant association between increase in interest rate and dependent variable.

With regard to follow up, 72.7% of total sample population responded that there is no proper follow-up to their business and some 27.3% responded the bank was conducted proper follow up with their business/project. As shown in the above table, out of 72.7% respondents whose projects did not have appropriate follow up, 71.6% were performing loans and 28.4% were defaulted. Similarly, out of those projects that appropriate follow up was conducted, 78% were performing and the left 22% were defaulters. Therefore there is a significant statistical difference between defaulters and non-defaulters in these averages, at 1% significance level (Table 4.9). This indicates that the continuous follow up of borrowers reminds them to pay attention toward their business and enables to increase their perception of responsibility toward loan repayment

Know your customer (KYC) also known as due diligence is a screening stage sorting of credit worthy customers. Reading of the table above, 53.3% respondents said such screening is not properly conducted while the left 46.7% answered their business/project have appropriate KYC study. Out of businesses that KYC was not conducted properly, 66.2% were performing loans while the remaining 33.8% were defaulters. Likewise, out of those KYC properly conducted, 81.4% were performing and 18.6% were defaulters. Statistically, chi-square result also confirms that there is strong and significance association between Kyc and loan repayment at 5% (X2 = 4.4836   P = 0.034) could find from Table 4.9. This reveals that the due diligence/KYC plays very important role in repayment of loan.

4.2.4. External Related Factors

External factors are factors of repayment performance which are beyond borrower, lending institution and the business itself. Most of the time these factors are unpredictable and uncontrollable by these bodies, thus it makes difficult in case of decision making in different institutions. In this study weather condition and market condition were selected as external factors of loan repayment performance on development Bank of Ethiopia, Jimma District customers. Since the majority of projects financed in this District were agricultural, the possibility of being affected by such external factors is natural.

Therefore, the table below has provided number of respondents who were challenged or were not challenged due to bad weather condition during running their business. Accordingly, 88 respondents or 58.7% were affected by bad weather condition and 41.3% were not affected by such conditions.

Regarding the repayment performances, out of 88(58.7%) respondents that were affected by bad weather conditions, 57(64.8%) were performing loans and 31(35.2) were defaulters. Out of those 62(41.3%) respondents who were not affected by bad weather conditions, 53(85.5%) were performing loans and the remaining 9(14.5%) were defaulters. The results of chi square didn't show the presence of significant relationship between bad weather condition and dependent variable.

*Table 4. 10 **whether condition and market condition against repayment**.*

Explanatory variable	Frequency	Loan repayment performances			
		Performing Loan	Nonperforming Loan	Total	
Bad weather(1)	88	57	31	88	X2 = 0.1555
	58.7%	64.8%	35.2%	100%	
No whether problem(0)	62	53	9	62	P = 0.693
	41.3%	85.5%	14.5%	100%	
Total	150	110	40	150	
	100	73.3%	26.7%	100%	
Market problem(1)	75	52	23	75	X2 = 1.2308
	50%	69.3%	30.7%	100%	
No market problem (0)	75	58	17	75	P = 0.267
	50%	77.3%	22.7%	100%	
Total	150	110	40	150	
	100	73.3%	26.7%	100%	

Source: Output from Survey Data, 2017

As regards to market conditions, 75 (50%) of sample respondents answered that there were a problem of poor market condition especially selling at lower price than expected one and the main reason of unfavorable market condition were due to international price fluctuation and less demander for the product and high amount of supplies and the remaining 75(50%) were not affected by market fluctuation. Therefore, out of 75 respondents affected by market conditions, 52(69.3%) were performing loans and 23(30.7%) were nonperforming. And out of 75 respondents that were not affected by market situations, 58(77.3%) were performing loans and the remaining 17(22.7%) were defaulted. The chi square also didn't recognize the existence of significant relationship between market conditions and the dependent variable.

4.2.5. Other Major Problems

In addition to the lists of variables discussed above, there are different challenges that hinders the repayment performances of loans by borrowers. So, respondents have stipulated different reasons, factors and challenges they faced and what they think was affecting their repayment performances. Here are some of them; majority of the responders sited that unavailability of skilled and unskilled labor, price fluctuation of the product, poor quality of the product and land overlap were other challenges of sampled customers.

Availability of skilled and unskilled labor: the establishment of projects especially agricultural farming projects needs the availability of skilled man power both for direct agricultural activities and administrative works. However, even if casual workers particularly during the time of harvesting and sowing are very important in farming, majority of the farm found in desert area were challenged by this factor.

Pricing and quality of product: the price of cotton, sesame and coffee product is largely degree depended on demanded quality, number of suppliers, production, market condition etc. (the price maker is the market itself). Thus, most of agricultural producers; especially cotton, coffee and sesame producers were challenged by price fluctuation of the market. Due to the presence of new entrants, unexpected weather condition and uncontrollable diseases and pest which is common for all agricultural products, had affected quality of their produce and hence production.

Land overlap: especially, projects found in Gambella region were been challenging by this problem because of using unreliable way of land providing to those potential investors from concerned institutions. Thus, based on citation from majority of borrowers even if it was not significant factor in econometrical analysis, land overlap problem was one of the causes for lag of loan process hence weak project performance leads to delinquency.

4.3. Econometric Analysis

In contrast to descriptive analysis, an econometric analysis or statistical analysis is the method of data analysis where mainly focus on coefficients, R-square, chi-square, standard error, tests, log likelihood ratio etc., which can be done using different software's such as STATA, SPSS and others. In this study STATA version 12 was adopted for the analysis of binary logistic regression coefficients and different tests. So, before running the binary logistic regression, the explanatory variables were checked using the following tests.

4.3.1. Model Tests

According to (Gujarati, 1995), for the econometric estimation to bring about best, unbiased/reliable and consistent result, it has to fulfill the basic linear classical assumptions. The basic assumptions include: linearity in parameters of the regression model, for given explanatory variables the mean value and the variance of the disturbance term (Ui) is zero and constant (homoscedastic) respectively, there is no correlation in the disturbances, no correlation between the regressors and the disturbance term, no exact linear relationship (multicollinearity) in the regressors and the stochastic (disturbance) term Ui is normally distributed. Naturally, therefore, if these assumptions do not hold well on what so ever account, the estimators derived may not be efficient. Based on the type of data (cross sectional type) used in this study, the most important tests such as heteroscedasticity, multicollinearity are conducted and the appropriate remedies were taken.

4.3.1.1. Test for Multicollinearity Assumption

If an independent variable has exact linear combination with the other independent variables, then we say the model suffers from perfect collinearity. This assumption is concerned with the relationships which exist between explanatory variables. 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 and such situation is called 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). There is no consistent argument on the level of correlation that causes multicollinearity.

There are two measures that are often suggested to test the presence of multicolinearity. These are: Variance Inflation Factor (VIF) for association among the continuous explanatory variables and contingency coefficients for dummy variables. The technique of variance inflation factor (VIF) was employed to detect the problem of multicolinearity among the continuous variables. According to Gujarati (2003), VIF can be defined as:

$$VIF(Xi) = \frac{1}{1 - Rj2}$$

Where, VIF is variance inflation factor, Ri^2 is multiple correlation coefficient and is explanatory variables Xi is explanatory variables. The result of VIF test is annex as Annex 3 at the end of this paper.

Table 4. 11 VIF of the Explanatory Variables used in the study

Variable	VIF	1/VIF
Education	1.71	0.583593
Kyc	1.44	0.693435
Loansize	1.44	0.695333
Timehorizon	1.41	0.711450
Graceperiod	1.34	0.747682
Otherbusin~s	1.29	0.772964
Businessse~r	1.26	0.791117
Income	1.26	0.791368
Marriage	1.24	0.804159
Collateral	1.23	0.813179
Gender	1.22	0.817818
Interest	1.22	0.818259
Businessform	1.22	0.822914
Age	1.20	0.830964
Households~e	1.19	0.839626
Whether	1.16	0.859426
Followup	1.13	0.883061
Equity	1.13	0.884816
Market	1.13	0.887345
Experience	1.12	0.891935
Diversion	1.09	0.913764
Mean VIF	1.26	

Larger value of VIF shows co-linearity across variables, thus if VIF exceeds 10 indicates that there was multicolinearity within continuous variables. The result shows that no categorical and dummy explanatory variables which have variance inflation factor near to 10 i.e. the maximum value among those dummy explanatory variables was 1.50 in case of loan size while 1.26 was an average VIF of all variables.

In addition to VIF, contingency coefficients were computed to check the existence of multicolinearity 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, X2 = 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.

Table 4. 12 Correlation matrix of coefficients of regress model

```
       e(V) |   Gender       Age Marriage Educat~n Househ~e Experi~e Otherb~s Busine~m Busine~r   Income Loanam~t
------------+----------------------------------------------------------------------------------------------------
     Gender |   1.0000
        Age |   0.0123   1.0000
   Marriage |   0.0119   0.1132   1.0000
  Education |  -0.1016   0.0805   0.1678   1.0000
Households~e |  -0.1766  -0.2098  -0.1919  -0.0241   1.0000
 Experience |   0.0499   0.0796  -0.0379   0.0028   0.0430   1.0000
Otherbusin~s |  -0.0107  -0.1843  -0.0094  -0.1512   0.0063   0.0688   1.0000
 Businessform |  -0.1868   0.0715  -0.1180   0.0908   0.0261   0.1947   0.0404   1.0000
 Businessse~r |   0.0417  -0.0780  -0.0571  -0.2016   0.0607  -0.0116  -0.0415  -0.0690   1.0000
     Income |   0.0888  -0.1700  -0.0591  -0.2683   0.0464   0.0007   0.0406  -0.1400   0.1151   1.0000
 Loanamount |  -0.0001   0.0459  -0.2583  -0.0890  -0.0358  -0.0142  -0.0166   0.1724  -0.3131  -0.1162   1.0000
  Diversion |  -0.0680  -0.1369  -0.0075   0.1029  -0.0013  -0.0530  -0.0022   0.0074   0.0265  -0.0277   0.0207
     Equity |   0.0886  -0.0742  -0.0693  -0.1436   0.1023  -0.0128  -0.0264  -0.1039   0.0921   0.1862  -0.0282
Graceperiod |   0.0291   0.1231  -0.1207  -0.0873   0.0859   0.1042  -0.2372   0.0207   0.0983  -0.0490  -0.1448
   Followup |  -0.0379   0.0030   0.0315  -0.0572  -0.0324  -0.0139   0.0240   0.1050  -0.0874  -0.1106  -0.0017
 Collateral |  -0.0424  -0.0762  -0.0517  -0.0296   0.0273  -0.0512  -0.0909   0.0981   0.0643   0.0451   0.0303
   Interest |  -0.0943  -0.0327   0.1511  -0.1199   0.0053  -0.0717   0.0976  -0.0510   0.0308  -0.0127  -0.2071
        Kyc |   0.0648  -0.0523  -0.0289  -0.2337  -0.0726  -0.1079  -0.1155   0.0374   0.0033   0.0883   0.0891
Timehorizon |  -0.1318  -0.0355   0.0771   0.3210  -0.0571   0.0919   0.0993  -0.0321  -0.0122   0.0936  -0.1239
     Market |   0.1758  -0.0265  -0.1309  -0.0591   0.0704   0.0601   0.0460  -0.0052   0.0902   0.0317   0.0671
    Whether |   0.1610   0.0824   0.0861   0.0529  -0.1941   0.0710   0.0632  -0.0234  -0.0334   0.0452   0.0125
      _cons |  -0.2784  -0.2898  -0.2912  -0.4279  -0.0671  -0.2707  -0.0251  -0.3133  -0.0877   0.0123  -0.1038

       e(V) | Divers~n   Equity Gracep~d Followup Collat~l Interest      Kyc Timeho~n   Market  Whether    _cons
------------+----------------------------------------------------------------------------------------------------
  Diversion |   1.0000
     Equity |  -0.0204   1.0000
Graceperiod |   0.0586   0.0188   1.0000
   Followup |   0.1182  -0.1482  -0.0211   1.0000
 Collateral |  -0.0273  -0.0439   0.0848  -0.0563   1.0000
   Interest |  -0.0292   0.0409   0.0072  -0.0076  -0.0034   1.0000
        Kyc |  -0.0235   0.0079  -0.1584  -0.0304   0.3433   0.1955   1.0000
Timehorizon |  -0.0044  -0.1111   0.0417   0.0936   0.0722  -0.0777  -0.1131   1.0000
     Market |  -0.0649   0.0547  -0.0336  -0.0709  -0.0230   0.0606   0.0034  -0.1829   1.0000
    Whether |  -0.0097   0.1174  -0.0986   0.0323  -0.0531   0.0927   0.0748   0.1305  -0.0049   1.0000
      _cons |   0.0029   0.0038  -0.0223  -0.0419  -0.1741  -0.0382  -0.0546  -0.4358  -0.1285  -0.3015   1.0000
```

4.3.1.2. Measures of Goodness of Fit

The conventional measure of goodness of fit, $R2$, is not particularly meaningful in binary regress and models. A measure similar to R2, called pseudo R2, is available, and also ranges between 0 and 1(Gujarati, 2004).

According to Kibrom (2010), the use of conventional R2 for goodness of fit when the dependent variable takes either 1 or 0 is not appropriate. "A summary measure used similar to the conventional R2 that have been suggested for models with qualitative dependent variable is pseudo R2. It should be noted, however, that in binary regress and 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 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 R2 is 81% or 0.81 (as it is depicted in the logistic regression). This result indicates that, the logit model explained about 81% of the variation and it lies in the [0, 1] interval.

4.3.1.3. Test for Normality assumption

Normality assumption (ut ~ N (0, σ2) state that a normal distribution is not skewed and is defined to have a coefficient of kurtosis 3. Bera-Jarque formalizes this by testing the residuals for normality and testing whether the coefficient of skewedness and kurtosis are zero and three respectively. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how fat the tails of the distribution are. To make sure that this assumption is valid or not, the residuals generated out of the regression model is plotted against the fitted values of the dependent variables. If this curve is like bell shaped distribution it can be concluded that the disturbance term is normally distributed with mean zero and constant variance one (i.e. N~ (0, 1)).

To get the residuals normally distributed first we have to make sure that each variables employed are found to be normally distributed. In this case, most of the variables are found to be normally distributed, the variables that are not normally distributed were transformed to logarithmic form, and the disturbance term becomes normally distributed. Therefore, normality test was checked out by using Kernel density estimate test. According to Kernel, using command "kdensity r, normal" whiles after the command of 'predict r' the graph shows normal distribution on estimated residual as compared with normal distribution reference line.

4.3.1.4. Heteroschedasticity

In general, heteroschedasticity is one of the problems of cross sectional data where it has assumed that homoscedasticity or constant variance in basic classical linear regression assumptions. Due to the indication for presence of such defects in the data were collected according to White's test, Breusch-Pagan test and residual plot test, the study was applied robust technique of estimation in the STATA set up which can easily detect the problem. The result is annexed at the annexation part of this paper.

4.3.2. Results of Regression Analysis

As shown in chapter three, the model used to find out and explain the association between the dependent variable and the independent variables is:

LRP =β1 + β2(Gdr) + β3(Ag) + β4(Mar) + β5(Educ) + β6(Hhs) + β7(Exp) + β8(Othbus) + β9(Busfrm) + β10(Bussctr) + β11(Income) + β12(Lnamt) + β13(Div) + β14 (Eq) + β15 (Grprd) + β16 (Folup) + β17 (Coll) + β18 (Int) + β19 (KYC) + β20 (Timhzn) + β21 (Mrkt) + β22 (Wthr)

Where LRP, Gedr, Ag, Mar, Educ, Hhs, Exp, Othbus, Busfrm, Bussctr. Incm, Lnamt, Div, Eq, Grprd, Folup, Coll, Int, KYC, Timhzn, Mrkt, Wthr denotes Loan Repayment performance, Gender, Age, Marriage, Education, House hold size, Experience, Other business, Business form, Business sector, Income, Loan size, Diversion, Equity, Grace period, Follow up, Collateral, Interest, KYC, Time horizon, Market and Whether respectively.

Under the following regression outputs the beta coefficient may be negative or positive; beta indicates that each variable's level of influence on the dependent variable. P-value indicates at what percentage or precession level of each variable is significant. R2 values indicate the explanatory power of the model.

Table 4. 13 Results of Binary Logistic regression, loan repayment performances.

```
-------------------------------------------------------------------------------
  Repayment |     Coef.    Std. Err.       Z     P>|z|     [95% Conf. Interval]
------------+------------------------------------------------------------------
     Gender |  -2.234012   64.67539     -0.03    0.972    -128.9954    124.5274
        Age |   1.498252    .938601      1.60    0.110     -.3413725   3.337876
   Marriage |   .1965257   1.236763      0.16    0.874    -2.227485    2.620537
  Education |   4.994262    2.29616      2.18    0.030*     .4938714   9.494653
 Familysize |  -2.783878   1.394197     -2.00    0.046*   -5.516454   -.0513033
 Experience |   4.997728    2.54503      1.96    0.050*     .0095619   9.985895
Otherbusiness|  5.08024    2.396175      2.12    0.034*     .3838236   9.776657
Businessform |  -.664479    .9807302    -0.68    0.498    -2.586675    1.257717
Businesssector| -1.532271  1.395945     -1.10    0.272    -4.268272    1.203731
     Income |   1.793644   1.533704      1.17    0.242     -1.21236    4.799648
   Loansize |   2.806922   1.503764      1.87    0.062*    -.1404005   5.754245
  Diversion |  -8.941219    4.74869     -1.88    0.060*   -18.24848     .3660423
     Equity |   1.589673   1.459438      1.09    0.276    -1.270772    4.450119
 Graceperiod |  4.900312   31.71605      0.15    0.877     -57.262     67.06263
   Followup |   3.399658   1.992316      1.71    0.088*    -.5052096   7.304525
 Collateral |   2.710324   1.934826      1.40    0.161    -1.081866    6.502513
   Interest |  -2.105947   1.666111     -1.26    0.206    -5.371464    1.15957
        KYC |   .8590335   1.453748      0.59    0.555    -1.990261    3.708328
Timehorizon |  -6.440273   2.561279     -2.51    0.012*   -11.46029   -1.420258
     Market |   2.231671   1.952738      1.14    0.253    -1.595625    6.058967
    Whether |  -.0583181   1.189738     -0.05    0.961    -2.390161    2.273525
       _cons|  -1.443807   64.80903     -0.02    0.982    -128.4672    125.5796
-------------------------------------------------------------------------------
```

Source: STATA version 12 Logistic regression result 2017,

Note: Coef. = coefficient, Std. Err = standard error, Pseudo R2 = 81%, Log likelihood = -18.25, Logistic Regression Chi-square =141.26

* Significance at 5% ** significant at 10%

Table 4. 14 Odds ratio of binary logistic regression, loan repayment performances.

```
-----------------------------------------------------------------------
    Repayment | Odds Ratio   Std. Err.      Z     P>|z|    [95% Conf. Interval]
--------------+--------------------------------------------------------
       Gender |   .1070979   6.926597    -0.03   0.972    9.51e-57   1.21e+54
          Age |    4.47386   4.199169     1.60   0.110    .7107941   28.15924
     Marriage |   1.217167   1.505347     0.16   0.874    .1077992    13.7431
    Education |    147.564   338.8306     2.18   0.030    1.638648   13288.48
   Familysize |   .0617984   .0861591    -2.00   0.046    .0040201   .9499905
   Experience |   148.0764   376.8588     1.96   0.050    1.009608   21717.96
Otherbusiness |   160.8127   385.3354     2.12   0.034    1.467887   17617.66
  Businessform |   .5145415   .5046264    -0.68   0.498    .0752699   3.517381
Businesssector |   .2160446   .3015863    -1.10   0.272     .014006   3.332528
       Income |   6.011317   9.219578     1.17   0.242    .2974944   121.4676
     Loansize |   16.55887   24.90063     1.87   0.062    .8690101   315.5271
    Diversion |   .0001309   .0006215    -1.88   0.060    1.19e-08   1.442016
       Equity |   4.902148   7.154379     1.09   0.276    .2806149   85.63712
   Graceperiod |   134.3317   4260.473     0.15   0.877    1.35e-25   1.33e+29
      Followup |   29.95385   59.67753     1.71   0.088    .6033791   1487.014
    Collateral |   15.03414   29.08845     1.40   0.161    .3389625   666.8155
     Interest |   .1217303   .2028162    -1.26   0.206    .0046473   3.188561
          Kyc |   2.360878   3.432122     0.59   0.555    .1366598   40.78555
   Timehorizon |    .001596   .0040877    -2.51   0.012    .0000105   .2416515
       Market |   9.315421   18.19058     1.14   0.253    .2027818   427.9332
      Whether |   .9433498   1.122339    -0.05   0.961    .0916149   9.713582
        _cons |   .2360275   15.29671    -0.02   0.982    1.61e-56   3.46e+54
-----------------------------------------------------------------------
```

Table.4.13 presented the regression result of Loan repayment Performances (LRP) as dependent variable and six borrowers specific, nine bank specifics, four business specific and two external factors as independent variables for the sample of 150 borrowers in Development Bank of Ethiopia Jimma District. The adjusted R-squared value for the model is around 81%, suggesting that almost 81% variance in repayment performances were explained by all mentioned explanatory variables. And also adjusted R2 value show that the overall goodness of the model. Accordingly, the value of R2 showing that model used in this study has good statistical health. F-statistics of the model has a p-value of 0, suggesting that all explanatory variables jointly can influence the repayment performances.

As shown in the above regression table the output of variables like Education, family size, Credit experience, Other business and time horizon were statistically significant factors affecting the repayment performances in Development Bank of Ethiopia at 5% significant level while loan size and loan diversion are statistically significant factors affecting the repayment performances in Development Bank of Ethiopia at 10% significant level. The coefficients of three significant variables, time horizon, family size and loan diversion were

negative and the left five, education, experience, other business, loan size and follow up were positive. The negative coefficient indicates that the dependent variable was associated with the independent variables negatively and the positive coefficient shows the positive influence of the variable on the dependent variable.

On the other hand, thirteen (13) variables were found insignificant on dependent variable namely gender, age, marital status, business form, business sector, income/profit, equity, grace period, collateral, interest rate, KYC/ due diligence, market condition and weather conditions were statistically insignificant influence on loan repayment performances. From these insignificant variables gender, family size, business form, business sector, interest rate and weather conditions are having a negative sign and the remaining insignificant variables bear positive sign. Overall, the binary logistic model predicted factors contributing to 81% of Development Bank of Ethiopia Jimma District loan repayment performances as revealed in the above table.

4.3.3. Discussions on Regression Results

The preceding sections present the overall results of the study. Thus, this section presented detail analyses of the results for each explanatory variables and their importance in loan repayment performances in accordance with the above regression result. In addition, the discussions analyses the statistical findings of the study in relation to the previous empirical evidences.

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

Time horizon: The result of logit model in table 4.13 indicated that time horizon have a negative influence on loan repayment performances and statistically became significant predictor of borrowers' loan repayment performance at 5% significance level. As indicated table 4.13 and 4.14, timely disbursement of loan increases the borrowers' loan repayment probability by 5.6%. Thus, the result is in accordance with the research hypothesis (time horizon has negatively influence repayment performances). This implies that getting service timely or after long time waiting, keeping the other thing constant has a resultant change of 5.6% increase or decrease the repayment in the opposite direction. I.e. The odd ratio of the econometric result indicates that disbursing the loan timely can reduce the probability of being default by 65% other things remain constant (table 4.13). There are a number of studies found negative relationships between time of disbursement and loan repayment performances. The result was consistent with the descriptive analysis result in preceding section of this same study and consistent with the study and findings of other research like studies by Shaik

and Tolosa(2014) confirmed that timely disbursement of loan increases the borrowers loan repayment probability.

Accordingly, the null hypothesis H2 is fail to rejected. That is the null hypothesis that expected positive relationship between delayed service and defaulting is accepted. Because the result of the regression proves that as the time of delivering service elongated the likelihood of defaulting increases and the probability of performing decreases.

Educational qualification; Table 4.13 and 4.14, shows that educational level is significant at 5% and positively related to borrowers ability to repay their loans. An increasing the level of education has the effect of decreasing the likelihood of defaulting by 14% ceteris paribus. This figure reveals that the borrowers whose educational is at tertiary level have the probability of decreasing default rate by 14 percent than the borrowers who is at elementary education level/ illiterates table 4.13. This implies that borrowers that were more educated may have access to business information, use their personal knowledge, skill and experience to properly manage their loan and repay timely. This result was consistent with preceding descriptive analysis of this study and these results are resembled with the output of Michael (2006) and Olomola (2009) described that default rate decreased with education level of the borrower increased.

The null hypothesis H1 is fail to reject. The null hypothesis stated that there is positive relationship between education and loan repayment performances, which found true under the regression result. So, the null hypothesis is accepted.

Family size: As shown under the logit regression table above, family sign showed significance to the dependent variable. It was hypothesized that a borrower having larger family number is likely to default than a borrower having small family number, and vice versa. The coefficient of family size is negatively related to the dependent variable, loan repayment performances and is strongly significant at 5% level. Increasing borrower's family size by one person decreases the likelihood of being able to repay one's loan. This means that the smaller the size of the borrower family, the higher the probability that borrowers will be able to repay their loans and vice versa. This result and conclusion is similar with the results under descriptive analysis is part of the study and the reason of such may resulted from the fact that large household sizes increased the household head's domestic responsibilities and thereby constituted leakage to the household's income stream. As household income depleted, liability of the household increased and there would be greater tendency to divert loans meant for borrower production resulting in default in loan repayment. The odds ratio

indicates as family number increases the likelihood of defaulting increases by 60 percent compared to small family holders. This result is similar with (Abbafita, 2005 and Berhanu, (2005).

The null hypothesis H1 is accepted. The null hypothesis stated that the increase in number of dependents/family increases the probability of defaulting and decreases the likely hood of performing the loan. The logistic regression result indicated this same result; hence accepted.

Other business: The variable other business has a positive sign as expected and is statistically significant at 5%. The result shows that as the borrower have other source of income his/her capacity to repay his loan increase. Under the descriptive analysis part of the study, having other business positively contributed to repayment performances and this result is almost the same with the results of this econometric logistic regression result. This implies that incases income from the project under consideration fail to meet their debt obligation income from such other source could help to settle their repayments. The studies made by (Kibrom, 2002) and (Abraham 2002) supports this result.

The logistic regression and chi square of fail to reject hypothesis H3. The null hypothesis which stated having other business in addition to the current one is better for repayment and there is positive relationship with repayment performances. The regression result showed this assumption true and the hypothesis is accepted.

Credit experience: The coefficient of this variable was expected to influence the repayment capacity positively and the result of logit regression shows the same as expected. P-value of the credit factor is statistically significant at 5% (0.050) and has a positive influence on the dependent variable, which is in line with the research hypothesis (there is a positive relationship between credit experience and repayment performances). The coefficient value of the variable (i.e.4.007) indicated a percentage rise/decline in years of experience resulted performing/ nonperforming of the loans. The coefficient value tells us there is a strong positive relationship between credit experience and repayment performances. The implication of this result is that those who had long credit experience have good knowledge of managing and handling the financial aspects of their business and at better position than those who never had such exposure. This result is the same with results presented under descriptive part of this research. This result agreed with (Firafis Haile, 2003).

The logistic regression and chi square of fail to reject hypothesis H1. The null hypothesis which stated having credit experience better for repayment and there is positive relationship with repayment performances. The regression result showed this assumption true and the hypothesis is accepted.

Loan Diversion: The coefficient sign of loan diversion shows that there is a negative relationship between loan diversion and loan repayment performances. This variable adversely and significantly influence loan repayment performances at 10% significance level, borrowers who diverted the loan other than the intended purpose are found to be defaulters. An application of entire loan for intended and productive business lessens the probability of defaulting by 0.060 (table 4.13). It is obvious that diverted loans miss their intended target and out of the sight of lending institutions. Hence, unless the responsible borrowers willingly pay their loan from such other business it would be difficult to repay the loan according to the terms of the contract. This result is the same with (Jemal, 2003), and results under descriptive analysis part of this research in preceding section. The null hypothesis H2 is failed to reject. The null hypothesis stated that there is negative relationship between loan diversion and loan repayment performances, which found true under the regression result. So, the null hypothesis is accepted.

Loan size: this variable also was found to influence borrowers' loan repayment performance positively and significantly at 10% significance level. Keeping the other factors constant, having sufficient loan size and operating business with adequate amount of capital decreases the probability of being defaulter by 0.088 (table 4.13). Large amount of money creates huge capacity to performance with full capacity and effective manner. Accordingly, loan size showed positive relationship with loan repayment performances indicating that the increase in the loan size likely increases the loan repayment capacity of the borrowers. This same result was found by Olomola (2009), Nawai and Shariff (2013), Abafita (2003). Shaik Abdul Majeeb PASHA (2014). The result here is almost presented in descriptive part of this study too. The null hypothesis H2 is accepted. The null hypothesis expected the positive relationship between loan repayment performances and loan size, which found to be true under logistic regression result. Hence, the null hypothesis is accepted.

Follow up: This variable was to have positive and significant association with the dependent variable. It is significant predictor loan repayment performance at 10% significance level. If other variables held constant, continuous follow up and visit of respondents reduces their probability of being defaulter by 0.088. The importance of follow up is unquestionable in every credit monitoring and loan collection. The odds ratio of the variable indicated that a project that follow up is properly made is 29.95% more likely to repay its loan than that never proper follow up is made. This result is the same with finding of Wongnaa(2013).

The null hypothesis H2 expected the follow-up to have positive relationship with repayment. The result of the logistic regression showed that there is strong positive relationship between loan follow-up and repayment of loans. Hence, the null hypothesis is accepted.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

The preceding chapter presented results and discussion of the study, while this chapter deals with conclusion and recommendation of the study based on the findings. Accordingly this chapter is organized into two sub-sections. The first section of this chapter discusses the conclusions part briefly and the second section presents recommendation for the findings.

5.1. Conclusion

The objective of this research is to identify and determine factors affecting loan repayment performances at DBE Jimma District. To achieve this broad objective, the study used both qualitative and quantitative data and the primary data was collected from 150 borrowers, nine senior expertise and three managers at different level of the bank using semi structured open ended and close ended questionnaire. For data analysis purpose both descriptive statistics and binary logistic model were employed.

Therefore, this study was intended to identify and discuss factors which affect borrowers' loan repayment performance and finally concludes that low repayment performance was one of the main problems of the District as compared to its plan and other performances such as loan appraisal, loan approval and disbursements. The descriptive statistics findings shows that there were significant association between dependent variable with respect to time horizon, level of education, family size, experience, other business, follow-up, loan size and loan diversion variables were significantly influenced the repayment performances of the loans. On the other hand, twenty one explanatory variables were entered in to binary logistic model and out of which eight variables were found significant to determine loan repayment performance of borrowers.

The results of this study revealed that the time horizon negatively and significantly affected the loan repayment performance of borrowers. Time lag between loan application and disbursement should be reduced to increase repayment rate. The complicated loan processing procedures, which might lead to delay in disbursement, further, it will increase default rate. When the bank deliver its services timely, the probabilities of paying loan and in the reverse if the bank fail to provide services after a long time of waiting and after time of utilizing opportunity is lapsed, the probabilities of defaulting is very high. 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 education qualification level determines loan repayment positively and significantly. The borrowers who attained higher education level able to pay better than the borrowers who were in lower level schooling and/or illiterates. Therefore, institution should motivate educated people and also easy to provide training. 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.

Family size also influenced the repayment performances of loans significantly and shows negative sign. This indicates that increasing in the number of family size, increases the probabilities of default and vice versa. Borrowers who have small number of or no dependents in the household perform better in loan repayment. The borrowers who support large number of dependents face difficulties of repayment. The logic behind is that the borrower having larger family size as compared to those having smaller family size have tremendous challenges to administer the demands of his/her family and run the business simultaneously. The larger family size have different needs and high consumption, while the small size borrowers can focus on administering their business without much challenges and difficulties

Loan size; is the other variable showing positive relationship with loan repayment performances and statistically significant. Repayment capacity of borrowers depends on the capacity of investments and the profit they generate from the business itself. A project, In order to operate with full capacity and without any financial constraints needs to have full financial support, including investment cost and working capitals. So, when huge capacity is created, the probability of defaulting is low and vice versa.

Loan diversion was also found as essential and significant factors of loan repayment rate negatively. Loan diversion is negatively affecting the loan repayment capacity. It is clear that diverted loans miss their target and cannot repay the loan according to the duty. This means, diverting loan into non-income generating activities increases default rate. Therefore, it is recommended that the institution should give attention to continuous follow-up on proper loan utilization

Credit experience is also another significant variable. A borrower having credit experience is at better position to repay its loan than those new comers. Because, while experienced borrowers use their skill, knowledge and familiarity in carrying out their duty, new borrowers faces new environment to begin from the scratch.

Having another business is another significant variable influencing the dependent variable positively. The help of having addition business is to use the experience such other business in running the current one and financial support in case of default. But this should be handled very carefully because the existence of another business may also be the cause of failure if diversion of money to such other business occurred. The positive sign and the significance is from the support and help it gives to the current business while the other side should be considered with caution.

The other significant variable was follow up. This variable influence borrower's loan repayment performance positively and significantly. Giving Projects proper follow up, the probability of default decrease since problems will be tackled immediately and utilize their loan effectively, generate revenue, and then make loan repayment. The follow-up and supervision made by the loan officers and concerned bankers should be increased and it leads to increase repayment performances.

Generally, the finding of the study failed to reject two research hypotheses that indicate the relationship between loan repayment performances and borrower related factors, specifically education level, family size of borrowers and experience and bank related factors like having other business, follow-up, loan size, time horizon and loan diversion whereas the remaining were insignificant.

5.2. Recommendation

It is apparent that DBE has to work to avert the loan repayment problems. The source of loan repayment performances as indicated under this research is from four different areas and the bank is required to work on the solution to bring about better performances. Financial performances and wellness is one criteria of measuring financial institution healthiness, which in cases of DBE is possible through loan approval collection and disbursement.

Now, Based on the analysis and findings of this study, the researcher therefore recommends that:

The study revealed that among personal or borrower characters, educational level, credit experience and family size were the main and significant factors of loan collection performance which was unattractive in the past consecutive years. From bank specific factors, time horizon, follow up, loan diversion and loan size were found significant variables and from business specific factors having another business is found significant variable.

Therefore, the bank is recommended to select and screened out those customers who are more educated and have credit experience in running related business. Proper due diligence should be conducted in screening customers with better educational level and credit experience. The major activities of screening is knowing the personal traits and history of the borrower and the feasibility and viability of the business. Hence, customer with better educational qualification and experience should be selected.

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. Disbursement dalliance was the problem, where the main challenge of the bank in the last four consecutive years. The main justification behind such dalliance was less number of contact officers and engineers as compared with financed projects which could unable to make necessary follow up and progress report.

Follow-up being one significant variable by itself, when properly implemented solve other related problems too. The bank has to increase the number of officers and engineers who has responsibility of taking full-fledged follow up and revision as well as progress report, respectively. Thus, follow up also as being one of significant factor, increasing the number of contact officers and give more attention on follow up can increase good performance of projects hence loan collection performance of the bank.

The other important recommendation is regarding loan diversion. The bank is highly recommended to follow the money released for project development and avert the diversion of loan. The main cause of loan diversion is lack or loose of following the money and progress supervision.

The other important recommendation is regarding loan size. In order to implement the project with full potential and capacity necessary capital should be allocated. Such loan size shouldn't be more than what is needed or less than what is required. So, the bank is recommended to conduct critical feasibility

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

Generally, internal factors can be easily controlled while external factors can be a threat to the viability of banks. Banks have to be vigilant in their lending decisions so as to avoid loan losses and the accumulation of non-performing loans. Banks need to concentrate on sectors that are performing well and avoid lending to those sectors which have already recorded a significant amount of non-performing loans. One thing to note is that, this result can be generalized to the whole banking sector in Ethiopia as almost all the banks have been affected by non-performing loans. Therefore, the recommendations generated are a prescription for all banks engaged on similar investment activities in Ethiopia.

APPENDIX

Appendix 1. Questionnaire paper

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JIMMA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF MANAGEMENT

MBA RESEARCH QUESTIONARY

<u>This Research Questionnaire is for academic purpose only!</u>

</div>

Dear respondent, this questionnaire is prepared to collect data on loan repayment performances, for the purpose of MBA research to be conducted under a title Factors affecting loan repayment performances in Development Bank of Ethiopia Jimma District. Get relaxed and feel free to respond the questions and focus on providing the required information to help the researcher do his/her job rightly. Hence, I kindly request you to fill the questionnaire very carefully and provide genuine information so as to help me find the actual reason for the identified problems. Advance thanks for your patience and time

Factors of loan repayment performance

A. **Borrower's related information**

B. Name of borrower(optional)_____

C. Gender   1) Male   0) Female

D. Age: 1. 15-30   2. 31-50   3. Above 51

E. Marital status 1. Single   2. Married   3. Divorced/widowed

F. What is your family size? --------------------------

   1. Small (1-3)   2. Medium (4-5)   3. Large (above 6)

G. Educational Background: 1. No formal education   2. Primary school completed   3. High School completed   4. College/University graduate

H. Do you have any credit experience in running similar project?   1) Yes   0) No.

   If yes, did it help you for current business? Explain how _____

I. **Business related questions**;

A. What is the current status of your business? 1. Performing good/successfully operating   2. Not good/defaulted(substandard, doubtful and loss)

B. What is your business form?   1. Sole proprietor   2. PLC   3. SHC and Others

C. What is your business sector?   1. Agriculture   2. Service   3. Industry

D. Have you gained sufficient income compared to your plan? 0) No   1. No

If no, why (list reasons) …………………………………………………………………..…

………………………………………………………………………………………………………

………………………………………………………………………………………………………

………………………………………………

E. Do you have other business?   1)yes   0) No

II. Institution related questions;

A. What is a Loan size permitted for the project? ---------------------- birr

B. Do you believe such amount is sufficient for your project as compared to feasibility study?   0) No
1) Yes

If no, explain how it affected your repayment performances---

----

C. Have you used any amount of money from the loan to operate some other business or used for your personal consumption?   0) No   1) yes

If yes, explain the amount, --

D. Amount of equity contribution? ------------------ birr

Is such amount 1) Exceed 30% of total investment   2. 30% only

E. Do sufficient grace period granted to begin repayments?   0) No   1) Yes

If No, explain how it affected your repayment capacity? --

F. Do you think the bank has made a proper follow up to the project?   0) No   1) Yes

G. Do you think the bank has secured its loan with enough/sufficient collateral in cases of default?
0) No   1) Yes

H. What is the collateral of the bank for the loan? Is there any property other than the project itself?
0) No   1) Yes

If yes, explain the amount---

I. What is the ratio of debt to collateral value? ---

J. How do you evaluate the change (increase) in interest rate, do you think it affected your repayment performances? 0) No   1) Yes

   If yes, is that positively or negatively? Explain --

K. Do you believe the KYC (know your customer) assessment was performed duly according to policy and procedures of the bank? 0. Yes   1. No

L. How do you evaluate the service period (time to conduct KYC, appraisal and approval)? 1. Timely 2. Elongated   3. Too late

   If such time has affected your repayment capacity, explain your reason. ---------------------------------

   ----

III.   External factors

   A. Do you think International/national market fluctuation affected your repayment performances?

      0) Yes   1) No

      If yes, what is the reason, how? ---

      --.

   B. Were the project attacked by pest and weed problem?

      0) Yes   1) No

      If yes, what are the causes? --

   C. Were the project faced bad weather condition problem like flood, too less or too much rainfall? 0)

      No   1) No

      If yes, what are the causes, explain ---

   Other factors

Elaborate other major challenges and factors that challenged the repayment of bank credit and over all performances of your business. ---

----

Thank you for your cooperation!

Appendix.2 Interview questions

<div align="center">

JIMMA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF MANAGEMENT

MBA RESEARCH INTERVIEW

</div>

This interview questions is for academic purpose only! (*For Bank staffs & officials*)

This interview questions are prepared to collect relevant data for my MBA research under a title 'Factors affecting loan repayment performances, the case of DBE Jimma District' and your answers thereby will be utilized for the same purpose. Thank you in advance for your willingness and cooperation and please help me in providing a genuine information. The confidentiality of the information you provide will be kept.

1. How do you analyses the current performances of the bank and what do you think contributed for such performances?

2. Do you believe the screening process and due diligence are duly conducted to select credit worthy borrowers? What are the limitations seen during the due diligence assessment?

3. Do you think the bank conducted the appraisal and approval activities duly as per the policy of the bank? What drawbacks do you observe regarding appraisal and approval process?

4. What do you think about the lengthy and time taking process in all screening, appraisal, approval and disbursement process of the bank? What do you think the bank should do to solve such problems?

5. Do you believe that the bank has done fledged follow up for its customers /loan? What are the results after project follow up?

6. How do you explain the impact of due diligence, loan appraisal, and project follow up with loan repayment?

7. What are the crucial confronting factors for loan repayment in the District?

8. What alternative measures were taken on the side of the bank to improve the repayment Situation?

9. Were the measures taken brought an improvement in repayment status of the project?

<div align="right">

Thank you!

</div>

Annex 3. Correlation matrix of coefficients of regress model

e(V)	Gender	Age	Marriage	Educat~n	Househ~e	Experi~e	Otherb~s	Busine~m	Busine~r	Income	Loanam~t
Gender	1.0000										
Age	0.0123	1.0000									
Marriage	0.0119	0.1132	1.0000								
Education	-0.1016	0.0805	0.1678	1.0000							
Households~e	-0.1766	-0.2098	-0.1919	-0.0241	1.0000						
Experience	0.0499	0.0796	-0.0379	0.0028	0.0430	1.0000					
Otherbusin~s	-0.0107	-0.1843	-0.0094	-0.1512	0.0063	0.0688	1.0000				
Businessform	-0.1868	0.0715	-0.1180	0.0908	0.0261	0.1947	0.0404	1.0000			
Businessse~r	0.0417	-0.0780	-0.0571	-0.2016	0.0607	-0.0116	-0.0415	-0.0690	1.0000		
Income	0.0888	-0.1700	-0.0591	-0.2683	0.0464	0.0007	0.0406	-0.1400	0.1151	1.0000	
Loanamount	-0.0001	0.0459	-0.2583	-0.0890	-0.0358	-0.0142	-0.0166	0.1724	-0.3131	-0.1162	1.0000
Diversion	-0.0680	-0.1369	-0.0075	0.1029	-0.0013	-0.0530	-0.0022	0.0074	0.0265	-0.0277	0.0207
Equity	0.0886	-0.0742	-0.0693	-0.1436	0.1023	-0.0128	-0.0264	-0.1039	0.0921	0.1862	-0.0282
Graceperiod	0.0291	0.1231	-0.1207	-0.0873	0.0859	0.1042	-0.2372	0.0207	0.0983	-0.0490	-0.1448
Followup	-0.0379	0.0030	0.0315	-0.0572	-0.0324	-0.0139	0.0240	0.1050	-0.0874	-0.1106	-0.0017
Collateral	-0.0424	-0.0762	-0.0517	-0.0296	0.0273	-0.0512	-0.0909	0.0981	0.0643	0.0451	0.0303
Interest	-0.0943	-0.0327	0.1511	-0.1199	0.0053	-0.0717	0.0976	-0.0510	0.0308	-0.0127	-0.2071
Kyc	0.0648	-0.0523	-0.0289	-0.2337	-0.0726	-0.1079	-0.1155	0.0374	0.0033	0.0883	0.0891
Timehorizon	-0.1318	-0.0355	0.0771	0.3210	-0.0571	0.0919	0.0993	-0.0321	-0.0122	0.0936	-0.1239
Market	0.1758	-0.0265	-0.1309	-0.0591	0.0704	0.0601	0.0460	-0.0052	0.0902	0.0317	0.0671
Whether	0.1610	0.0824	0.0861	0.0529	-0.1941	0.0710	0.0632	-0.0234	-0.0334	0.0452	0.0125
_cons	-0.2784	-0.2898	-0.2912	-0.4279	-0.0671	-0.2707	-0.0251	-0.3133	-0.0877	0.0123	-0.1038

e(V)	Divers~n	Equity	Gracep~d	Followup	Collat~l	Interest	Kyc	Timeho~n	Market	Whether	_cons
Diversion	1.0000										
Equity	-0.0204	1.0000									
Graceperiod	0.0586	0.0188	1.0000								
Followup	0.1182	-0.1482	-0.0211	1.0000							
Collateral	-0.0273	-0.0439	0.0848	-0.0563	1.0000						
Interest	-0.0292	0.0409	0.0072	-0.0076	-0.0034	1.0000					
Kyc	-0.0235	0.0079	-0.1584	-0.0304	0.3433	0.1955	1.0000				
Timehorizon	-0.0044	-0.1111	0.0417	0.0936	0.0722	-0.0777	-0.1131	1.0000			
Market	-0.0649	0.0547	-0.0336	-0.0709	-0.0230	0.0606	0.0034	-0.1829	1.0000		
Whether	-0.0097	0.1174	-0.0986	0.0323	-0.0531	0.0927	0.0748	0.1305	-0.0049	1.0000	
_cons	0.0029	0.0038	-0.0223	-0.0419	-0.1741	-0.0382	-0.0546	-0.4358	-0.1285	-0.3015	1.0000

.

Annex 4. VIF test result

Variable	VIF	1/VIF
Education	1.71	0.583593
Kyc	1.44	0.693435
Loanamount	1.44	0.695333
Timehorizon	1.41	0.711450
Graceperiod	1.34	0.747682
Otherbusin~s	1.29	0.772964
Businessse~r	1.26	0.791117
Income	1.26	0.791368
Marriage	1.24	0.804159
Collateral	1.23	0.813179
Gender	1.22	0.817818
Interest	1.22	0.818259
Businessform	1.22	0.822914
Age	1.20	0.830964
Households~e	1.19	0.839626
Whether	1.16	0.859426
Followup	1.13	0.883061
Equity	1.13	0.884816
Market	1.13	0.887345
Experience	1.12	0.891935
Diversion	1.09	0.913764
Mean VIF	1.26	

Annex 5. Logit regression result

```
Logistic regression                           Number of obs   =        150
                                              LR chi2(21)     =     141.26
                                              Prob > chi2     =     0.0000
Log likelihood = -16.359487                   Pseudo R2       =     0.8119
```

Repayment	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
Gender	-2.234012	64.67539	-0.03	0.972	-128.9954	124.5274
Age	1.498252	.938601	1.60	0.110	-.3413725	3.337876
Marriage	.1965257	1.236763	0.16	0.874	-2.227485	2.620537
Education	4.994262	2.29616	2.18	0.030	.4938714	9.494653
Householdsize	-2.783878	1.394197	-2.00	0.046	-5.516454	-.0513033
Experience	4.997728	2.54503	1.96	0.050	.0095619	9.985895
Otherbusiness	5.08024	2.396175	2.12	0.034	.3838236	9.776657
Businessform	-.664479	.9807302	-0.68	0.498	-2.586675	1.257717
Businesssector	-1.532271	1.395945	-1.10	0.272	-4.268272	1.203731
Income	1.793644	1.533704	1.17	0.242	-1.21236	4.799648
Loanamount	2.806922	1.503764	1.87	0.062	-.1404005	5.754245
Diversion	-8.941219	4.74869	-1.88	0.060	-18.24848	.3660423
Equity	1.589673	1.459438	1.09	0.276	-1.270772	4.450119
Graceperiod	4.900312	31.71605	0.15	0.877	-57.262	67.06263
Followup	3.399658	1.992316	1.71	0.088	-.5052096	7.304525
Collateral	2.710324	1.934826	1.40	0.161	-1.081866	6.502513
Interest	-2.105947	1.666111	-1.26	0.206	-5.371464	1.15957
Kyc	.8590335	1.453748	0.59	0.555	-1.990261	3.708328
Timehorizon	-6.440273	2.561279	-2.51	0.012	-11.46029	-1.420258
Market	2.231671	1.952738	1.14	0.253	-1.595625	6.058967
Whether	-.0583181	1.189738	-0.05	0.961	-2.390161	2.273525
_cons	-1.443807	64.80903	-0.02	0.982	-128.4672	125.5796

Annex 6. Logistic regression of categorical variables

```
------------------------------------------------------------------------
  Repayment | Odds Ratio  Std. Err.      z     P>|z|    [95% Conf. Interval]
------------+-----------------------------------------------------------
    _IAge_2 |  1.125774   .8320763     0.16    0.873     .2644331    4.792773
    _IAge_3 |  9.261878   9.800595     2.10    0.035     1.164092    73.69037
_IMarriage_2 | 1.309394   .8651349     0.41    0.683      .358649    4.780475
_IMarriage_3 | 11.06442   16.85735     1.58    0.115     .5585586    219.1738
_IEducation_2 | 6.165825  7.782631     1.44    0.150      .519502    73.18048
_IEducation_3 | 282.0967  401.4662     3.96    0.000*    17.33844     4589.72
_IEducation_4 | 1379.739  2426.282     4.11    0.000*    43.94939     43315.3
_IBusinessf_2 | .0496303  .0442256    -3.37    0.001*    .0086545    .2846121
_IBusinessf_3 | .9602172  1.019277    -0.04    0.969     .1198983     7.68999
_IBusinesss_2 | 4.847324  5.179998     1.48    0.140     .5968732    39.36606
_IBusinesss_3 | .4423924  .6805392    -0.53    0.596     .0216966    9.020371
_IHousehold_2 | .5290126   .459665    -0.73    0.464      .096349    2.904589
_IHousehold_3 | .0805831  .0743908    -2.73    0.006*    .0131963      .49208
_ILoanamoun_2 | .4663687  .3681641    -0.97    0.334     .0992585    2.191246
_ILoanamoun_3 | 1.423455  1.377071     0.36    0.715     .2137368    9.480002
       _cons | .3954776   .5345418    -0.69    0.493     .0279645    5.592896
------------------------------------------------------------------------
```

Annex 7. The odds ratio of logistic regression

```
Logistic regression                          Number of obs   =        150
                                             LR chi2(21)     =     141.26
                                             Prob > chi2     =     0.0000
Log likelihood = -16.359487                  Pseudo R2       =     0.8119
```

Repayment	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf. Interval]	
Gender	.1070979	6.926597	-0.03	0.972	9.51e-57	1.21e+54
Age	4.47386	4.199169	1.60	0.110	.7107941	28.15924
Marriage	1.217167	1.505347	0.16	0.874	.1077992	13.7431
Education	147.564	338.8306	2.18	0.030	1.638648	13288.48
Householdsize	.0617984	.0861591	-2.00	0.046	.0040201	.9499905
Experience	148.0764	376.8588	1.96	0.050	1.009608	21717.96
Otherbusiness	160.8127	385.3354	2.12	0.034	1.467887	17617.66
Businessform	.5145415	.5046264	-0.68	0.498	.0752699	3.517381
Businesssector	.2160446	.3015863	-1.10	0.272	.014006	3.332528
Income	6.011317	9.219578	1.17	0.242	.2974944	121.4676
Loanamount	16.55887	24.90063	1.87	0.062	.8690101	315.5271
Diversion	.0001309	.0006215	-1.88	0.060	1.19e-08	1.442016
Equity	4.902148	7.154379	1.09	0.276	.2806149	85.63712
Graceperiod	134.3317	4260.473	0.15	0.877	1.35e-25	1.33e+29
Followup	29.95385	59.67753	1.71	0.088	.6033791	1487.014
Collateral	15.03414	29.08845	1.40	0.161	.3389625	666.8155
Interest	.1217303	.2028162	-1.26	0.206	.0046473	3.188561
Kyc	2.360878	3.432122	0.59	0.555	.1366598	40.78555
Timehorizon	.001596	.0040877	-2.51	0.012	.0000105	.2416515
Market	9.315421	18.19058	1.14	0.253	.2027818	427.9332
Whether	.9433498	1.122339	-0.05	0.961	.0916149	9.713582
_cons	.2360275	15.29671	-0.02	0.982	1.61e-56	3.46e+54

Annex 8. Hetroschedasticity tests

….imtest, white

White's test for Ho: homoskedasticity against Ha: unrestricted heteroskedasticity

 chi2(100) = 108.81

Prob> chi2 = 0.2571

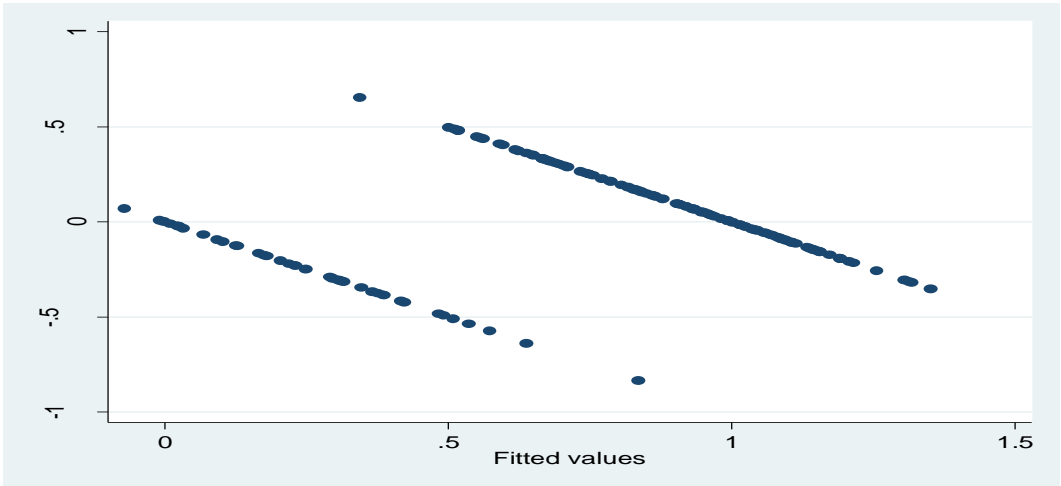| Source	chi2	Df	p
Heteroskedasticity	108.81	100	0.2571
Skewness	66.82	20	0
Kurtosis	0.1	1	0.7565
Total	175.73	121	0.0009

….hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

    Ho: Constant variance

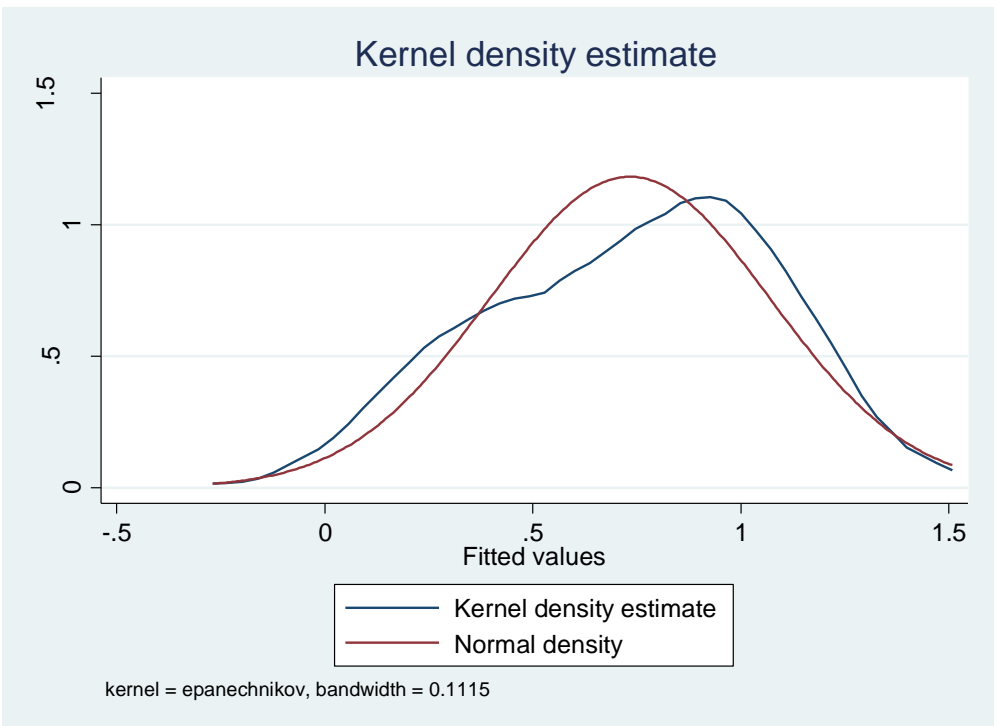   Variables: fitted values of Repayment

chi2(1)   = 3.4 Prob> chi2 = 0.0526

………. rvfplot

Appendex 10. Kernel density normality test

Kernel density estimate

kernel = epanechnikov, bandwidth = 0.1115

---End--