Determinants of Agricultural Project Credit Default in Commercial Bank of Ethiopia: A Study in Jimma District

A Thesis Submitted to the School of Graduate Studies in Partial fulfillment of the Requirements for the Award of Master of Art's in Project Management and Finance

By

TESHALE DABA

JIMMA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

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JIMMA, ETHIOPIA

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Under the Guidance of

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Mr. Asteraye Enyew (MSc)

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JIMMA UNIVERSITY
COLLEGE OF BUSINESS & ECONOMICS
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CERTFICATION

This is to certify that the thesis entitled *"Determinants of Agricultural Project Credit Default in Commercial Bank of Ethiopia: A Study in Jimma District*", Submitted to Jimma University School of Graduate Studies for the award of the Degree of Master of Art's in Project Management and Finance (MPMF) and is a record of valuable thesis work carried out by Mr. Teshale Daba, under our guidance and supervision as University's Advisors.

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

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DECLARATION

I hereby declare that this thesis entitled "*Determinants of "Agricultural Project Credit Default in Commercial Bank of Ethiopia: A Study in Jimma District",* has been carried out by me under the guidance and supervision of Dr. Arega Seyoum and Mr. Asteraye Enyew.

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

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This is to certify that the thesis undertaken by Mr. Teshale Daba entitled: "Determinants of Agricultural Project Credit Default in Commercial Bank of Ethiopia: A Study in Jimma District" and submitted for partial fulfillment of the Requirements for the degree of Master of Art's in Project Management and Finance complies with the Rules and Regulations of the University and fulfills the accepted standards with respect to originality and quality.

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Research and Postgraduate Program Coordinator

Abstract

The main aim of this study is to investigate the determinants of Agricultural Project Credit Default in Commercial Bank of Ethiopia, Jimma District. The study focused on bank specific factors, borrower specific factors and external factors that determine agricultural project credit default. In the study both qualitative and quantitative approach were adopted. The total number of study population was seventy seven employees those who are directly or indirectly participated in credit processing and the sample size was sixty five employees. This sample size was determined according to Israel (2009), the simplified formula for sample size determination at 95% confidence level. Using Likert scale structured questionnaire, a survey was conducted on credit performers of the bank who directly or indirectly involved in agricultural project credit process commencing from potential credit customer recruitment to loan settlement or loan recovery. To check for the reliability of the data, the researcher has checked for the data reliability test by using Cronbach's-Alpha and all the data were reliable to use. Then, the researcher has checked the correlation between dependent variable and explanatory variables by using correlation matrix and confirmed that there correlation between dependent and independent variables. The test of normality has undertaken to determine the regression model by using Kolmogorov-Smirnov, Shapiro-Wilk as well as Histogram and the test has shown that the residuals were not normally distributed around the fitted lines. Hence, the researcher has used Ordinal Logit Regression Model rather than linear regression model after checked for model fittings/Goodness-of-fit by using Pearson and Deviance test of goodness-of-fit and confirm that the model is well fit. The findings of the study indicated that the credit policy and procedural attributes of the bank, credit appraisal, and project credit management, character of the borrower, economic environment, political environment and infrastructure have significant impact on agricultural project credit default while credit origination, workout loan and banking industry have insignificant impact on credit default. Based on the findings the researcher has given policy implications to the concerned by body.

Keywords:
Agricultural Project Credit Default, Commercial Bank of Ethiopia, Ordinal Logit Regression Model,

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ACRONYMS/ABBREVIATIONS

CBE –	Commercial Bank of Ethiopia
NBE –	National Bank of Ethiopia
APCD –	Agricultural Project Credit Default
CPPA –	Credit Policy and Procedural Attributes
CO –	Credit Origination
CA –	Credit Appraisal
PCM –	Project Credit Management
WL –	Workout Loan
CB –	Character of the Borrower
BI –	Bank Industry
EE –	Economic Environment
PE –	Political Environment
IS –	Infrastructure

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Project financing is the raising of funds on a limited resource or non-resource basis to finance an economically separable capital investment project in which the providers of fund look primarily to the cash flow from the project as the source of funds to service their loans Zinat, (2010).

It is an innovative financial technique that aims to fund the investment project based on economic and financial characteristics of the project itself, rather than on indebtedness capacity of the project promoter, Neila, (2012). Hence, the ability of the project lenders to recoup the advancements and interest thereon depend substantially on the performance of the project. This typically involves assessing the technical aspects of the project as well as its economic projections. Project Finance thus involves a degree of sophistication in credit analysis that extends beyond normal loans. While lenders would engage their own experts to evaluate the feasibility study submitted by the borrower, lenders must be capable of evaluating the technical and financial projections, as well as the assumptions used in their studies. Enzo (2012).

In Ethiopia, as in many developing countries, the growing demand of investment in agriculture, industry, construction, hotel and tourism, energy and transportation requires huge amount of funds to be invested in it. CBE annual report indicates a growing demand of project loans at an increasing rate (CBE Annual report, 2018). For such increasing demand of project loan, Commercial Bank of Ethiopia (CBE) as the largest bank in the country should be able to finance such projects in order to be benefited from such opportunities and contribute to the country's growth and transformation plan. In line with the national planning, CBE is trying its level best in financing various investment projects (both government and commercial) that contribute to the development goal of the country. Hence, Projects, as crucial building blocks of development, it has to be financed

provided that it is technically feasible, financially viable and environmental friendly. According to CBE's lending procedure, Project finance is a medium or long-term loans intended for financing of the acquisition and/or leasing of fixed business assets, for the establishment of a new project and expansion of the existing business. The loan may embody initial working capital finance (CBE Credit procedure Vol. I, 2018).Due to its nature, in most of the cases, project finance requires huge resource mobilization than other credit products. Accordingly, the risk inherits and the payoffs are great. Hence, CBE shall make its utmost effort to avoid or minimize the risk of agricultural project loan default in as much as possible. However, to the best knowledge of the researcher there is adequate researches have not been undertaken broadly that assess the determinants of agricultural project credit default in banking industry in general and Commercial Bank of Ethiopia in particular with the exception of some study made on the area, such as the study undertaken by Fikirte (2015) on the determinants of Project Credit Default in Commercial Bank of Ethiopia. So, it is this scenario that motivated the researcher to undertake the study on determinants of agricultural project credit default by assessing the factors that determine it due to bank specific factors, borrower specific factors and external factors. This project paper, therefore tries to explore the basic determinants of agricultural project credit default in general and particularly determinants in connection with the bank, borrower specific and external factors.

1.2. Statement of the Problem

Bankers naturally try to balance the issue of maximizing profit by lending and at the same time manage risk of loan default as it would deteriorate profit and capital. Thus, a bank needs to be cautious in advancing loans, as there is a greater risk, which follows it in a situation where the loan is defaulted (Paterson and Wadman, 2004).

Although, Commercial Bank of Ethiopia tries to mitigate the risk associated with the project loan; by investing a huge resources on education and training, to acquire new knowledge in project appraisal techniques, the ratio of non- performing loan from the total loan portfolio is growing from year to year and still it is above the

bank's tolerance limit. From the total outstanding project term loan more than birr200 billion; includes public projects, as at June 30, 2020, the bank had planned NPL amount to be less than 2.5% out of total outstanding loan, but the actual NPL ratio of project term loan as at June 30, 2020 was about 11%. This is far from the expected standard of the bank (Annual performance review, July 2020). This indicates, CBE is unable to achieve its plan to minimize the non-performing project loans to its tolerable limit level that is below 2.5% out of total outstanding loan balance. With limited resource, the impact of categorized project loan under NPL is bad for the financer due to the following facts: Since the amount of the loan is relatively huge, if the project fails, the financer are likely to lose a considerable amount of money and the bank's liquidity position will be in problem. The assets that hold as collateral are usually located in a remote location. Hence, the recoverability of the loan from the liquidation of asset will be very less. So, it is not a surprise if the financer goes to extensive efforts to ensure that the risks associated with the project loans are reduced or eliminated as far as possible. In order to alleviate the problem, Commercial Bank of Ethiopia has investing much in training to acquire new knowledge on project financing though in vain. However, the bank has not tried to study at least in a formal way to know the determining factors for the occurrence of default, whether it is due to internal environments or external factors. Factors responsible for loan default are evident by various empirical studies. Bad loans make a major negative effect on Bank's lending potentiality and financial performance in terms of return on investment. The problem can also lead to banking crises and even finally to insolvency, Asanty & Tensey (2014).

To reduce the default rate and to enhance the sustainability of the bank, it is important to identify the various factors which have significant impact on agricultural project credit default from borrower's point of view. Hence, this study aimed at identifying the factors that affect Agricultural Project Credit Default of Commercial bank of Ethiopia, Jimma District.

The reasons for undertaking this study is that, to the best of the researchers knowledge it appears that adequate researches have not been made broadly that assess the determinants of agricultural project credit default in banking industry in general and Commercial Bank of Ethiopia in particular with the exception of some study made on the area, such as the study undertaken by Fikirte (2015) on the determinants of Project Credit Default in Commercial Bank of Ethiopia.

Even though, agriculture is the backbone of Ethiopian economy, currently, the only two banks owned by the government namely Commercial Bank of Ethiopia and Development Bank of Ethiopia had terminated to finance agricultural project loan due to large amount of non-performing loan both banks have reported and this has great impact on agricultural development of the country as well as on the profitability of the bank. Hence, it is this scenario, which motivated the researcher to assess various bank specific, borrower specific and external factors that cause the occurrence of default in Agricultural Project Credit in the case of Commercial Bank of Ethiopia, Jimma District and attempts to provide answers for the following basic research questions.

1.3. Research Questions

This research tries to answers the following research questions;

- What are the bank specific factors of agricultural project credit default?
- What are the major causes of agricultural project credit default, due to borrower specific factors?
- What are the external factors that significantly contribute to the occurrence of default in agricultural project finance?

1.4. Objective of the Study

1.4.1. General Objective

The general objective of the study is to assess the major determinants of agricultural project credit default in the case of Commercial Bank of Ethiopia, Jimma District.

1.4.2. Specific Objectives

The specific objectives of the study are:

1. To assess bank specific factors that significantly contributes to agricultural project credit default.
2. To investigate the major causes of agricultural project credit default due to borrower specific factors
3. To identify the major determinants of agricultural project credit default in connection with external factors.

1.5. Significance of the Study

The significance of the study would be derived from its objectives, in which the bank would use the findings of the study as an input to mitigate the risks of agricultural project credit from falling under the category of NPL and also the bank become in a better position to appraise technically feasible and financially viable agricultural projects that contribute to the national economy in general and the profitability of the bank in particular and also academicians and researchers would be benefited from this study in that they would be provided with relevant information regarding agricultural project credit default and its effect on financial performance as well as its impact on agricultural sector. The findings shall stimulate other researchers to venture into credit default management and proper credit appraisals. This will also contribute to the general body of knowledge and form a basis for further research. This can be achieved if the Bank identifies the determinants of agricultural project credit default. Thus, this study is used for:

- Policy makers to formulate successful credit policies and procedures that would in turn help in allocating financial resources effectively and efficiently.
- The management of the bank clearly understand the extent to which the impact of credit policy and procedural attributes, credit appraisal, project credit management, character of the borrower, economic environment, political environment and infrastructures on agricultural project credit default.

- This paper helps the researchers to identify the factors behind agricultural project credit default and to undertake the research on related issues in the future.

1.6. Delimitation of the study

The study has conducted only by focusing on the credit performer's perception who directly or indirectly involved in agricultural project credit processing from the recruitment to the end of the project life cycle that means only from the bank side. This is due to the perception of the credit performers' action working on agricultural project credit might be influenced by their perception. Hence, it can also affect the project performance in agricultural project financing. However, this study did not include the opinions of the borrowers those who had availed agricultural project credit and defaulted by various reasons. Since those borrowers had already defaulted andhave minimized their relationship level with the bank, it was difficult to get an interview them so as to have a data from borrower's point of view and also most of agricultural project sites are located in remote area with security problem and costly to go physically at project site to collect the data from project owner/promoter. The researcher has used ordinal regression model to assess the factors affecting agricultural project credit default, in which the study was restricted to Commercial bank of Ethiopia, Jimma District only.

1.7. Limitations of the Study

The main aim of the study is to examine determining variables of Agricultural Project Credit default in Commercial Bank of Ethiopia and to ascertain statistical significance of the parameters in the model. The chosen variables might not be the only variables that have capable of influencing agricultural project credit default. The study consists of 65 observations; that are credit performers those who directly or indirectly participated in agricultural project credit processing. However, the study did not include the opinions of the borrower's those who had been financed in the form of agricultural project credit and defaulted by various reasons and due to these borrowers' have reducing their relationship level with the bank, it was difficult to get and interview them so as to have a data from

borrower's point of view and also most of agricultural project sites are located in remote area with security problem to go physically at project site.

In addition to the above mentioned limitations, only very few literatures and studies are found on this specific area in case Commercial Bank of Ethiopia.

1.8. Ethical Issues

Almost all the financial institutions have strict policy implications on the confidentiality of their data. They can pay the ultimate price for the breach of this duty of confidentiality. Disclosing of information by employees to a third party can expose the institution to potential legal conflict. Due to this ethical issue, they are fearful in disclosure of such information. However, this fear was addressed by explaining the core of the study to the information providing agents with the assurance that the data will be handled professionally through formal letter. Therefore, before data collection, permission is obtained from the management body of the bank through formal letter. The formal letter was taken from Jimma University specifically from the research and postgraduate studies office of business and economics collage and then given to the bank management and the concerned employees has responded freely and confidentially.

1.9. Organization of the Paper

The paper is organized as follows, Chapter one dealt with introduction, statement of the problem, research questions, objective of the study, significance of the study, delimitation an limitation of the study, significance of the study, were discussed. Chapter two dealt with the theoretical and empirical reviews related to agricultural project credit default. Chapter three were present data description and data sources, methodology of the study, Econometric model specification, methods of data analysis which include data reliability test analysis whereas Chapter four deals with the data analysis and interpretation of the result. Lastly, chapter five provides conclusions and policy options recommendation of the study based on the findings.

CHAPTER TWO

LITERATURE REVIEW

2.1. Theoretical Literature Review

Project Finance is a financing mechanism where a firm (project sponsor) forms a separate legal project company whose assets and cash flows are separated from the firm and provides equity and raise non-recourse debt to carry out a specific business operation for a finite period. On the other hand, the firm (non-sponsor) can finance project without legally separating it from its existing assets, and this method of financing is called corporate finance. (Zinat, 2010)

In addition to the above main difference, project finance is characterized by high investment costs and high risks. In most of the cases, the types of financing covered by project financing is large complex and expensive installation that might include power plants, chemical processing plants, mines, transportation infrastructures, telecommunication infrastructures, etc.(Basel II, 2001). Commercial Banks are the largest providers of project-finance- nearly 90% of the private sector project finance debt is raised by Banks. Yescombe, E.R (2014).

In addition, project finance may take the form of financing of the construction of a new capital installation or refinancing of an existing installation, with or without improvements. The borrower is usually an SPE (Special purpose entity) that is not permitted to perform any function other than developing, owning and operating the installation. The consequence is that repayment depends primarily on the project cash flow and the collateral value of the project's assets (Basel, 2001).

2.1.1. Project Financing Concepts and Definition

In the project finance business, banks may offer two kinds of service; advisory service and financing services. The project finance has two sources of funds; debt and

equity. Debt capital is usually provided by commercial Banks and international investment banks while equity capitals is usually provided by project sponsors and outside equity investors. (Enzo, 2012)

Project Finance is a financing mechanism where a firm (project sponsor) forms a separate legal project company whose assets and cash flows are separated from the firm and provides equity and raise non-recourse debt to carry out a specific business operation for a finite period of time. On the other hand, the firm (non-sponsor) can finance project without legally separating it from its existing assets, and this method of financing is called corporate finance. Zinat (2010).

Esty (2001) further explains the difference between Project Financed investments from corporate financed investments as the assets are financed as stand-alone entities rather than as part of a corporate balance sheet (Esty and Megginson, 2001). In the case of project financing, although creditors may have partial recourse for a period of time or for a fraction of the total loan amount, project loan by its definition is non-recourse to sponsoring organization. Esty and Megginson, (2001)

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In addition, project finance may take the form of financing of the construction of a new capital installation or refinancing of an existing installation, with or without improvements. The borrower is usually a special purpose entity that is not permitted to perform any function other than developing, owning and operating the installation. The

consequence is that repayment depends primarily on the project cash flow and the collateral value of the project's assets (Basel II, 2001).

2.1.2. Basic Characteristics of Project Finance

Based on the review of various literatures the characteristics of project Finance is summarized as follows; Yescombe, E.R. (2014), Enzo (2012), Basel (2001), and Zinat (2010). The project usually relates to major infrastructure with a long operating life. Hence, the financing must also be for a long-term (5-15 years), lenders rely on the future cash flow to be generated by the project to pay their interest and fees, and repay their debt. Therefore, the project must be ring-fenced (legally and economically self-contained), and the project is usually carried out through a special purpose legal entity (usually a limited company whose only business is the project company). There is a high ratio of debt to equity (Leverage or gearing) - roughly speaking, project finance debt may cover 60-70% of the capital cost of the project. The project company's physical asset are likely to be worth much less than the debt if they are sold after a default on the financing and in project involving public infrastructure they cannot be sold anyway. So, the main security for lenders is the project company's contracts, licenses or other rights, which are the source of its cash flow. Therefore, lenders carry out a detailed analysis of the project risks, and how these are allocated between various parties. The project has finite life, based on such factors as the length of the contracts or licenses, or reserves of natural resources. So the project-finance debt must be fully repaid by the end of the project's life. There is no guarantee from the investors, in the project-finance debt so this is non-recourse finance.

2.1.3. Definition of Project Credit Default and Concepts

The definition of default for this study adopted is based on the standard Basel II definition of default, which captures a wider range of defaults, including circumstances wherein a reporting bank considers that the obligor is unlikely to pay its credit obligation in full. Hence, According to Basel II (2001), a project is in default if a payment is past

due more than 90 days on any material credit obligation, the lender takes a charge-off or an account-specific provision because of a perceived deterioration in credit quality of the project exposure, the lender sells the project instrument at a material credit-related loss, the lender consents to a distressed restructuring likely to result in a diminished financial obligation caused by the material forgiveness of principal or interest, the obligor has sought or has been placed in bankruptcy protection and a project is resolved from default if after default, a project loan(s) resumes scheduled payments on a regular basis meaning returns to performing loan, following restructuring workout, scheduled payments resume based on restructured debt service, the lender sells or transfers the defaulted debt instrument, liquidation proceeds have been distributed to creditors, bankruptcy process is completed and the guarantor provides additional capital support covering some portion of scheduled debt service.

In broad terms, the Basel II, (2001) definition of default not only captures the events which are included in Moody's definition of default, but also captures a wider range of defaults, reflecting subjective assessments made by the reporting bank. For example, under the Basel II definition, defaulted credits would also include debt obligations where the bank puts the credit obligation on non-accrued status and makes a charge-off or account-specific provision resulting from a significant perceived decline in credit quality subsequent to the bank taking on the exposure in theory; therefore, the number of defaults reported under the Basel II definition might differ materially from the number of defaults considered have to be occurred under Moody definition of default.

There is no commonly accepted definition for project failure. The definition adopted for the purpose of this study is the operational definition by NBE Directive 2012, which defines Non-performing Loans as loans whose credit quality has deteriorated such that full collection of principal and/ or interest in accordance with the contractual repayment terms and conditions is not realized for more ninety days from the scheduled payment date or maturity. These loans categorized under **Substandard**, which is loans past due for more than 90 days (ninety days) or more, but less than 180 days (One hundred eighty

days) months; **Doubtful** that is loans past due for more than 180 days (one hundred eighty days) or more, but less than 1 year (three hundred sixty five days) and **Loss,** which is loans past due for more than 365 days (one year) or more, NBE directive No SBB/52/2012 sub 7.1.3. Different authors define project failure from different perspective and context. According to Carlos (2002), a project is considered as failed when it has not delivered what was required, in line with expectations. Therefore, in order to succeed, a project must deliver utilizing the minimum cost possible, the expected quality, and on the time scheduled; and it must deliver the benefits presented in the business case.

Even if a project has delivered everything that was in the detailed project designs, it may still be considered a failure if it did not include vital elements that the key stakeholders needed (Carlos, 2002). According to him, project success and failure is not just about the facts, nor is it simply about what was delivered. It is also, crucially, about how the project is perceived.

McConnell (2010) expanded the definition of project failure more than expectation. According to him, project failure is a situation when a given project, which consumes human, material and financial resources, fails to deliver an acceptable return on investment, so it is terminated before the completion, no sufficient value is produced, and no benefit is delivered to the customer. The project is considered "failed" when it does not produce results as proposed, exceeds its budget and time, and does not meet specifications. He concludes that a project is termed as failed when it does not meet the following criteria; (i) it is delivered out of schedule (time constraint); (ii) it is delivered out of budget (cost constraint); (iii) it is delivered out of scope (scope constraint) and the project product does not work as expected.

The Ethiopian Foreclosure law (proclamation number 97/1998, Article 3) states that the bank financed business can be considered as failed and foreclosed when a Bank's claims are not paid within the time set in the contract. This definition is also contextually similar

with McConnell definition that says projects are considered as failed if not produce results as proposed or expected, because Bank financed projects are expected to settle their debt as per loan contract agreement. Similarly, the non-performing loan directive of National Bank of Ethiopia Number SBB/48/2010 stipulates that those financed projects failed to pay the due loans for more than one year to be classified as loss loan and obliged the bank to hold 100% provision.

2.1.4. Non-performing Loans (NPL)

It is well known that credit is the major and primary source of income by banks so that a bank is willing to lend as much of its funds as possible in order to maximize profit. However, banks have to be careful about the safety of such advances (Radha, M., 1980).

Bankers naturally try to balance the issue of maximizing profit by lending and at the same time manage risk of loan default as it would impair profit and capital .Thus a bank needs to be cautious in advancing loans as there is a greater risk which follows it in a situation where the loan is defaulted (Paterson and Wadman ,2004).

According to the International Monetary Fund, non- performing loans are defined as defaulted loans which banks are unable to get profit from. They are loans which cannot be recovered within stipulated time that is governed by the laws of a country. (IMF, 2009)

Non-performing loans generally refer 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 (Fofack, 2005).

Disclosure of the extent of these losses in its financial statements may lead to a loss of confidence in the bank's management and a reduction in its credit ratings. This will in turn increase the bank's cost of borrowing in the wholesale market and make it more expensive or more difficult to raise capital. In extreme cases, it can leads to a loss of deposits, the withdrawal of the bank's authorization and ultimately insolvency. Taylor, M.G., (1993).

Deterioration in banks' loan quality is one of the major causes of financial fragility. Past experience shows that a rapid buildup of bad loans plays a crucial role in banking crises (DemirguçKunt and Detragiache, 1998, and Gonzalez Hermosillo, 1999).

It is widely accepted that the quantity or percentage of non-performing loans (NPLs) is often associated with bank failures and financial crises in both developing and developed countries. In fact, there is abundant evidence that the financial/banking crises in East Asia and Sub-Saharan African countries were preceded by high non-performing loans. The recent global financial crisis, which originated in the US, was also attributed to the rapid default of sub-prime loans/mortgages. In view of this reality it is therefore understandable why much emphasis is placed on non-performing loans when examining financial vulnerabilities (Sorge, 2004).

The criterion for identifying non-performing loans varies. Some countries use quantitative criteria to distinguish between "good" and "bad" loans (e.g., number of days of overdue schedule payments), while others rely on qualitative norms (such as the availability of information about the client's financial status, and perspectives about future payments). However, the Basel II Commission emphasizes the need to evolve toward a standardized and internal rating-based approach. Accordingly, the Basel committee puts non-performing loans as loans left unpaid for a period of 90 days as has been mentioned in the preceding paragraphs. Under the Ethiopian banking business directive, non-performing loans are defined 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 (NBE, 2008)."
In addition to the above-mentioned category of non- performing loans, overdrafts and loans or advances that do not have pre-established repayment program shall be non-performing when the debt remains outstanding for 90 (ninety) consecutive days or more beyond the scheduled payment date or maturity; The debt exceeds the borrower's approved limit for 90 (ninety) consecutive days or more and interest is due & uncollected

for 90 (ninety) consecutive days & more and for the overdrafts; when the account has been inactive for 90 (ninety) consecutive days or deposits are insufficient to cover the interest capitalized during 90 (ninety) consecutive days or the account fails to show the 20% of approved limit or less debit balance at least once over 360 days preceding the date of loan review.

The economic and financial costs of these impaired loans 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. These 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 assets (Fofack, 2005).

2.2. Empirical Literature Review

So far, the researcher found two relevant articles at Ethiopian banks worked by Fikirte (2015) on the determinant of default in project finance, in the case of commercial Bank of Ethiopia and Adamu, (2013) on the determinants of failure for project financed by Commercial bank of Ethiopia were reviewed. The applied explanatory research; fifteen determinant variables were used to measure their significance for Commercial financed projects failure. All of the variables, except project implementation time overrun have shown that the expected magnitude of influence on the dependent variable - project failure. One of the key findings of the researcher reversed and inducted that decrease of project failure as time overrun increases for project implementation. According to the researcher observation, this was attributed to the intervention of the Bank to protect the projects from failure through rescheduling of loan repayment, reallocation of loan and interest payment weaving; because these corrective measures found statistically

significant in reducing project failure. The project specific explanatory variable, project size that proxied by investment cost of the project was exhibited the same effect on project performance and statistically insignificant. Out of three project specific variables included in the study two variables (sales shortfall and recruitment variation) were found statistically significant. The remaining, relevance of the project owner's educational background or experience was found statistically insignificant. These statistically significant variables, sales shortfall and recruitment variation clearly have shown that the seriousness of marketing knowledge gap and poor understanding about the importance of human resource for project success respectively in case of Ethiopian project owners.

Regarding creditor (Banks') specific explanatory variables, the study considered operational projects and estimated the significance of cash flow over estimation for project failure. Loan appraising capacity and technical support were mentioned as project success cause in this study but not measured in any of regression model they used. In the study he considered as explanatory variables and measured in logit model. However, their estimation in logit model has exhibited that the insignificance of cash flow overestimation and technical support through follow-up operation for DBE project failure Adamu, (2013).

Even though, investment cost overrun of the project used to measure different explanatory variable in his study, the result of the same has shown similar magnitude on project performance and statistically significant. The impact of economic growth on project performance measured using GDP indictor of the economic sub-sectors in which the project is categorized considered in this study. The estimation of this inductors has shown that statistical not significant Adamu, (2013). In the study macroeconomics explanatory variable, inflation rate is tested but found statistically insignificant.

According to Adamu, (2013), regarding sociopolitical variable, the researcher had used population size, political regions, literacy level and religion dominancy. The estimation results of population size in the study has shown that the statistical significance of the variable and similar direction of influencing project performance. The sociopolitical

variables, the result of literacy level has shown statistical significance for project failure. Political regions and religion dominancy, which captured by dummy variables are also found statistically insignificant.

Fikirte, (2015), used data gathering instruments survey, document review and an in-depth interview. The questionnaire was distributed to all 52 credit performers in Commercial Bank of Ethiopia, but only 40 have completed and returned successfully. Hence 77% of the populations were involved in the survey. Since, the large portion of the population are customer relationship managers followed by credit appraisal experts, the large portion of the respondents, i.e. 48% and 27% are also customer relationship managers and credit appraisal experts respectively. Besides, all the credit performers who involved in the project financing process, from the initial customer's loan application to final loan recovery measures in case of default, were included in the survey. According to the study most of the respondents had ample experience in the banking area as well as in the credit process. Moreover, they were well qualified. Hence, they had a better knowledge in project finance and determinants of default. In order to strength the findings obtained from the survey, a document study was made on the record basis of the actual major cause of default for 45 outstanding project loan borrowers. In addition, to reinforce the findings from the survey and the document study, and to understand the situation in full context, an in-depth interview was conducted on credit directors who had ample experience in the banking area as well as in project finance. According to Fikirte, (2015), the results obtained from the survey on; bank specific determinants of default, borrower specific determinants of default and external factor determinants of default are summarized against the literatures and presented as follows:

The empirical study made by Fikirte (2015) indicates the existence of factors in connection with credit origination i.e. poor due diligence assessment to know the customer and weak credit negotiation have found to be the major determinant of loan default as per the results obtained from the survey. In addition the interview result also affirms these facts. Weak credit assessment made by the Bank and lack of proper skills of the loan officers were found to be the cause of default, as per the study made by Fikirte,

(2015). However, speedy loan processing due to external pressure as a factor for loan default was not supported by the survey result.

Additionally, there is a significant relationship between over-finance and the occurrence of NPL, as the survey result indicated. The survey result also indicates the existence of strong relationship between poor loan monitoring and NPL. Moreover, according to the researcher the interview result and the document study have supported such finding. However, inadequate debt recovery regulations were not mentioned as a cause of default, as per the study made by Fikirte (2015). .

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

The study of Birhanu and Fufa (2008) said that regarding the characteristics of borrowers, repayment of loans depend on the willingness and ability of the borrowers to repay. Therefore, individual borrowers can either repay their loans or choose to default. Defaults may be intentional or unintentional in contrast, intentional or strategic default can happen due to moral hazard behavior by the borrowers. This happens when borrowers have enough money or have the ability but refuse to fulfill their commitment. Most of the studies are conducted mostly in developed countries and some in developing countries. However, very few studies are conducted in the Ethiopian context regarding determinants of default in project credit. The study conducted in Ethiopia is in all banks regardless of the ownership structure and the size of the Banks. Moreover, no special focus is given to

Commercial Bank of Ethiopia though it is the largest Bank in Ethiopia who has a great exposure in agricultural project credit financing. Most of the studies are conducted on the overall credit default determinants. However, very few studies conducted specifically on the project loan. Considering the above gap, the researcher will try to contribute some to the research by focusing only in Commercial Bank of Ethiopia, Jimma District and considering only in Agricultural Project Loan cases.

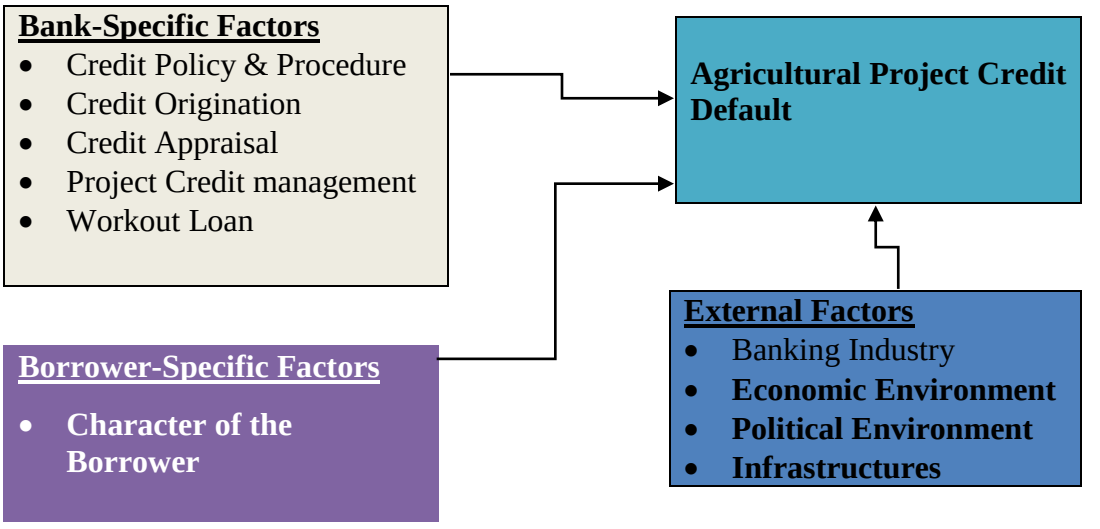
Hence, this study therefore try to assess various bank policy induced variables, commodity specific nature, source of equity contribution and credit evaluation criteria factors that might cause the occurrence of default in agricultural project finance in the case of Commercial Bank of Ethiopia, Jimma District from credit performers perception to answer the following research questions:-

- What are the bank specific factors of agricultural project credit default?
- What are the major causes of agricultural project credit default, due to borrower specific factors?
- What are external factors that significantly contribute to the occurrence of default in agricultural project credit?

2.3. Conceptual Framework

The main objective of this study is to identify the determinants of default in agricultural project finance by commercial banks of Ethiopia. Based on the main objective of the study, the following conceptual model /framework/ has been developed. Even though, there is some literature that found on the determinants of agricultural project credit default, still there is huge amount of non-performing loan in the bank. As previously discussed in the related literature review parts and a few studies mentioned above, defaults of project finance is caused by bank's specific related factors, borrower's related factors and macro/external/ environment related factors. Therefore, based on theoretical and empirical literature, tentative conceptual framework was developed as follows:-

Figure 2.1: Relation between agricultural project credit default and its factors.



CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1. Research Design

Research methodology is the path through which researcher need to conduct the research. It shows the path through which the researcher formulates statement of the problem and objective and presents the result from the data that was obtained during the study period. The research design and methodology chapter also shows how the research outcome at the end was obtained in line with meeting the objective of the study. Hence, this chapter discusses the research methods that were used during the research process. It includes the research methodology of the study from the research strategy to the result presentation.

Research methodology is the process of outlines the research strategy, research design, research methods, the study area, data sources, population consideration, sample size determination, data collection methods, methods of data analysis, data analysis software, the reliability of data, validity of qualitative data analysis, data quality management, including criteria, ethical consideration and presentation of result and its utilization approaches. In order to satisfy the objectives of the study, a qualitative and quantitative research method were used in general. The researcher would have used these mixed strategies; because, the data were obtained from all aspects of the data source during the study time. Therefore, this methodology was satisfied the research plan and target devised by the researcher.

Both quantitative and qualitative methods were used for this study. Since the two methods have their own strengths and limitations. The researcher has used both methods to benefit from the strengths and avoid the limitations arising from using a single method.

i. The Quantitative Research Approach

This approach was used to answer questions about the relationship among the important variables with the purpose of explaining, predicting and controlling phenomenon. The quantitative research approach has two strategies of inquiry. The first is survey design which provides a quantitative or numeric description of trends, attitude or opinion of a population by studying a sample of that population. From the sample population, the researcher has generalized about the population and predicts the trends being observed. In order to understand the relationship between the two measured variable, i.e. Agricultural project credit default as a dependent variable and various bank specific, borrower specific and external factors determinants as an independent variable, a survey design was used via structured questionnaire containing closed type of question.

This quantitative research method minimizes subjectivity and arrives at more objective conclusion. However, quantitative approach is limited to the outcomes outlined only in the questionnaire. Hence, it is weak in understanding the context.

ii. The Qualitative Research Approach

In order to minimize the limitation mentioned above in the quantitative approach and to obtain additional insight more than outlined in the questionnaire, in a less structured and more flexible approach a qualitative approach is used. However, qualitative method has a limitation because of the difficulty in generalizing findings to a large group as limited number of participants is involved in this approach.

3.2. Research Design

The research design is intended to provide an appropriate framework for a study. A very significant decision in research design process is the choice to be made regarding research approach since it determines how relevant information for a study were obtained; however, the research design process involves many interrelated decisions.

It sets the conceptual structure with which a study was conducted. It constitutes the blue print for collection, measuring, presentation and analysis of data collected. In this study, the researcher was used both descriptive and explanatory data analyses. Descriptive statistics like table, percentage, etc was used to describe the data and explanatory analysis using econometrics ordinal logit regression model was employed to analyze cause-effect relationship between determinants of agricultural project credit default against the independent variables in commercial bank of Ethiopia, Jimma District from the credit performer's perception point of view. Setting of major determinants of agricultural project credit default in commercial bank of Ethiopia, Jimma District based on the related literature review and factors unique to agricultural projects. The researcher has collected the data using structured questionnaire at one point in time to know the determinants of agricultural project credit default from the credit performers' point of view.

3.3. Target Population and Sample Size

The target populations of the study were the credit performers of the Commercial Bank of Ethiopia, Jimma District such as director of the district, credit management manager, credit appraisal manager, customer relationship managers, credit appraisal expert, credit appraisal officers, customer relationship officers, credit administrators and branch manager. To make the scope more specific and no to make the study bulky; the target populations of the study were the credit performers of the Commercial Bank of Ethiopia, Jimma District such as director of the district, credit management manager, credit appraisal manager, customer relationship managers, branch managers, appraisal expert, appraisal officers, Customer relationship officer and credit administrators etc. In the determination of purposive sample size, the three criteria are very important to gather the required data from sample respondents. These includes the level of precision, the level of confidence or risk and the degree of variability in the attributes being measured that would enable the researchers to determine appropriate sample size (Miauous& Michener, 1976). Therefore, the total numbers of credit performers in Commercial Bank of Ethiopia, Jimma district who do have direct and indirect involvement in agricultural project credit

processing. The primary source of data were obtained by using the questionnaire to the district credit performers under the credit line like officers, appraisal experts, relationship mangers, appraisal manager, credit management manager, Branch manager and district director were selected to fill the questionnaire. To maintain the representativeness of the samples to all credit-processing units of the bank as much as possible, all credit performers have been considered in this study.

According to simplified formula for proportions sample size determination at 95% confidence level, Israel (2009); out of all credit performers at the district office and branch manager who participate in credit processing of agricultural project credit directly or indirectly.

$$n = \frac{N}{\{1+N(e2)\}} \quad \text{..... (1)}$$

$$n = \frac{77}{\{1+77(0.0025)\}} \quad \text{..... (2)}$$

$$n = \frac{77}{1.1925} \quad \text{..... (3)}$$

$$\underline{n = 65}$$

Where **n** is the sample size, **N** is the population size, and **e** is the level of precision. By using this formula at 95% confidence level and 5% level of precision the sample size has been obtained for the study.

3.4. Source of Data for the Study

A data source is simply the source of the data. It can be a file, a particular database or even a live data feed. The data might be located on the same computer as the program, or on another computer somewhere on a network, books, reports, bulletins, documents etc. There are two sources of data. These are primary sources of data and secondary sources of data. Primary data sources include information that will be collected, processed directly by the researcher, such as observations, surveys, interviews, questionnaire and focus groups. Secondary data sources include information retrieved through pre-existing sources: research articles, internet, annual reports of the bank, documents or library

searches, etc. However, for this research purpose, the researcher had collected secondary data from the bank's annual reports 2017/2018, different documents, bulletins, Credit portfolio management report via management information system and primary data through structured questionnaire from CBE, Jimma District credit performers.

3.5. Data Collection Methods

Methods of data collection primarily depended on standard questionnaires prepared by Swaminathan (2004) which was prepared in the form of open ended and closed ended questionnaire. However, to measure the determinant of default rate at CBE Jimma District, the researcher modify in relation to the study for that matter the researcher test the reliability and check the dependability. For the purpose of data collection, the researcher used closed-ended and open-ended structured questionnaires. Closed-ended questionnaires were prepared on the basis of determinants of agricultural project credit default variables from the credit expert's perspective at Commercial Bank of Ethiopia. Thus, closed-ended questionnaires helps to avoid pressure upon the respondents in any direction and better be able to obtain the required data in the study area.

The questionnaire was divided into two parts. The first part contained the demographic characteristics of the respondents who were requested to provide information about their age, gender, education level, year of service or experience, job position and opinion of respondents on agricultural project credit default. The second part was designed to incorporate all possible Credit Policy and Procedure Attributes of the bank, Credit Origination, Credit Appraisals, Project credit management, Workout Loan, Character of the Borrower/Project Promoter, Banking Industry, Economic Environment, Political Environment and Infrastructures that leads to agricultural project default. This section of the questionnaire was designed to enable the researcher to gather information about the determinants of agricultural project credit default of Commercial Banks of Ethiopia. For all questionnaire included in part two, the respondents were requested to indicate their feeling on the questionnaire to measure weighted as follows: 1=strongly disagree, i.e., very much dissatisfied with the case described, 2=disagree, i.e., not satisfied with the case

described, 3=neutral, i.e., uncertain with the case, 4=agree, i.e., feeling alright with the case described, and 5= strongly agree, i.e., very much supporting the case described and also part two contains open-ended questions, which seeks the general comments of respondents about agricultural project credit practices that contribute to the occurrence of agricultural project credit default. In order to avoid biases by the respondents, the purpose of the study, that only for the academic purpose and the confidentiality of the response were explained at the beginning of the questionnaire.

3.6. Methods of Data Analysis

The data was collected from primary source and then checked and in-house editing was undertaken to detect errors that had been committed by the respondents. Then, the edited data were coded and manually entered into statistical package for social science (SPSS) version 20 computer software. Moreover, both qualitative and quantitative methods of data analysis techniques were employed. Analysis of data in this research was done by using descriptive statistical methods like: frequency, mean, standard deviation and inferential statistical methods such as reliability test, Multicollinearity test, correlation analysis and ordinal logit regression analysis. In addition to these, the data was analyzed properly by using non-parametric ordinal logit regression model. The researcher has used this model due to the residual is not normally distributed around the fitted lines. But, if the residual were normally distributed around the fitted lines, it would possible to use parametric model /linear regression model/. The regression analyses were conducted to determine to what extent the independent variables that are Credit Policy and Procedure Attributes of the bank, Credit Origination, Credit Appraisals, Project credit management, Workout Loan, Character of the Borrower/Project Promoter, Banking Industry, Economic Environment, Political Environment and Infrastructures explains the dependent variable which is Agricultural project credit default. Correlation analysis was conducted to test whether there is a positive significant relationship between the dependent variable and the independent variable. Finally, in the discussion and summary part of the study, the data obtained from the survey have been analyzed against the literatures. The information

obtained from the document study was also summarized as additional information to reinforce what would have obtained from the survey result.

3.7. Econometric Model Selection

So as to achieve the objectives of the paper, the study was conducted primarily based on structured questionnaire data. The advantage of using questionnaire data and knowing the determinant variables was examined using descriptive statistics and inferential statistics such as: correlations, regression analysis. Correlation matrix was used to examine the relationship between the dependent variable and explanatory variables. The dependent variable in this study is Agricultural project credit default that takes Likert scale ordinal values specifically 1 to 5 that is strongly disagree to strongly agree. The normality test of the data is statistically significant; meaning the data is not normally distributed around the mean /predicted line/. So, our model should non-parametric, ordinal regression model is the fitted model for this kind of research/Not normally distributed data. Pearson is used to determine the significance level of each independent and control variable in influencing credit default. The regressions model was run using ordinal logit regression, to test the casual relationship between the dependent and independent variable to determine the most significant and influential independent variables and other control variables affecting the project credit default at Commercial Bank of Ethiopia, Jimma District. In connection to this, the general model for this study, as is mostly found in the existing literature is represented as follows:-

$$\boldsymbol{Yi,t = \alpha + \beta Xit + eit} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textit{(4)}$$

The subscript 'i' representing the cross-sectional dimension and '*t*' denote the time-series dimension. The left-hand variable 'Yi,t, represents the dependent variable in the model, which is agricultural Credit default at CBE. 'Xi,t' Contains the set of independent variables in the estimation model, is taken to be constant over time 't' and specific to the individual cross-sectional unit 'i'. If 'α' is taken to be the same across units, then ordinal model regression provides a consistent and efficient estimate of 'α' and 'β'.

As of the above model, the structured questionnaire data constructed by taking independent variable which determines loan default at Commercial Bank of Ethiopia was analyzed by using the ordinal regression model. The ordinal regression model underlying response variable 'Yi' in this study was defined by the regression relationship of explanatory variables that contain major determinants of agricultural project credit default in CBE, Jimma District, Credit Policy and Procedure Attributes of the bank, Credit Origination, Credit Appraisals, Project credit management, Workout Loan, Character of the Borrower, Banking Industry, Economic Environment, Political Environment and Infrastructures factors as shown here under:-

$$Yi = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \beta 5X5 + \beta 6X6 + \beta 7X7 + \beta 8X8 + \beta 9X9 + \beta 10X10 + \varepsilon \quad \ldots\ldots (5)$$

Where, Yi = Agricultural Project Credit Default in Commercial Bank of Ethiopia, Jimma District

β = Vector of unknown parameters.

X1= Credit Policy and Procedure Attributes of the bank

X2= Credit Origination

X3= Credit Appraisals

X4= Project credit management

X5= Workout Loan

X6= Character of the Borrower

X7= Banking Industry

X8= Economic Environment

X9= Political Environment

X10= Infrastructures

ε = Error term

β1, β2, β3, β4, β5, β6,β7,β8,β9 and β10 = slope of each independent variables and they measure by what extent affect the dependent variable, that is agricultural project credit default in this case.

3.8. Definition of Variables

In order to achieve the objectives of this study, the researcher selected different variables based on literatures that could have impact on the dependent variables either positively or negatively. Hence, based on availability of data the variables selected in this study are to signify the determinants of agricultural project credit default and the variables which are attributable and likely to affect the dependent variable.

3.8.1. Dependent (Explained) Variables

Agricultural Project Credit Default (APCD) is variable that is employed as a dependent variable. It is an agricultural project credit default by passing loan repayment due date for more than 90 days and above that are substandard loans, doubtful loans and loss loans ratio. The NPL loan ratio is derived by dividing the sum of non-performing loans for total outstanding loan.

3.8.2. Independent (Explanatory) Variables

In the study, there are ten independent variables that explain the dependent variable such as credit policy and procedural attributes of the bank, Credit Origination, Credit Appraisals, Project credit management, Workout Loan, Character of the Borrower, Banking Industry, Economic Environment, Political Environment and Infrastructures.

Credit Policy and Procedure: -It is a set of guidelines that sets credit and payment terms for borrowers and establishes a clear course of action for late payments while the credit procedure is outlines the all activities and responsibilities in obtaining a credit approval for a potential credit customer before the credit was processed. The Credit Procedure reduces potential collection problems for the bank.

Credit Origination: -It is all the process performed to gather information to know about the customer before conducting a detailed credit analysis and also is the process by which a lender or other credit granting institution approves for a new credit product or exposures (such as a new loan, mortgage, credit card etc) and performs initial processing.

Credit Appraisal: -Credit appraisal is basically refers to assessing a particular loan application or proposal in a thorough manner in order to determine the loan amount and the repayment ability of the applicant.

Project Credit Management: - Project Credit management is the process of monitoring and collecting payments from customers. A good Project credit management system minimizes the amount of capital tied up with debtors. It is very important to have good credit management for efficient cash flow. This can only be achieved through good credit management practices. It is also the process of granting credit, setting the terms on which it is granted, recovering this credit when it is due, and ensuring compliance with company credit policy, among other credit related functions.

Workout Loan: -In a loan workout, the lender and the borrower often negotiate a solution to a defaulted loan to avoid a bankruptcy proceeding. A borrower and its lender may restructure the loan, amending its existing agreements or entering into a forbearance or waiver agreement.

Character of the Borrower: - Lenders need to know the borrower and guarantors are honest and have integrity. Additionally, the lender needs to be confident the applicant has the background, education, industry knowledge and experience required to successfully operate the business.

Bank Industry: -It deals with the impact of poor credit culture in the country as well as unfair competition among commercial banks on agricultural project credit defaults.

Economic Environment: - The term economic environment refers to all the external economic factors such as inflation, unstable and unpredictable market situation, exchange rate and labor cost that have impact on agricultural project credit default.

Political Environment: -It is an external factor such as political security and unfair compensation payment that leads to agricultural project credit default in this study context.

Infra Structure: - Infrastructure is an external factor that include transportation facility, road access to project site, water supply, information technology and electric power supply that has impact on agricultural project credit default.

3.9. Reliability Test

According to Leedy and Ormrod (2005) reliability of a measurement instrument is the extent to which it yields consistent results when the characteristics being measured has not been changed. Furthermore, Cameron et al., (2007) states that in order to increase reliability, the researcher should use the same template as far as possible and use static methods. To ensure the reliability of measurement instrument the researcher performed first standardize the instrument from one person or situation to another. One of the most commonly used indicators of internal consistency is Cronbach's Alpha coefficient. Ideally, Cronbach's Alpha coefficient scale should be above 0.7 (De Vellis 2003).The Cronbach's Alpha score ranges from 0 to 1 (Nunnally and Bernstein, 1994). In the current study the Cronbach's alpha coefficient of all constructs are greater than 0.7 except Economic Environment 0.68 which exceed the 0.60 minimum threshold and acceptable. This shows almost all constructs of current studies have good the internal consistency (inter-correlations) scale with the exception of single variable, which is economic environment acceptable for reliability test of data.

Table 3.1: Total Statistics of Cronbach's Alpha

Variables	Cronbach's Alpha
Agricultural Project Credit Default	.774
Credit Policy & Procedural Attributes of the Bank	.749
Credit Origination	.754
Credit Appraisal	.749
Project Credit Management	.737
Workout Loan	.753
Character of the Borrower	.742
Bank Industry	.770
Economic Environment	.685
Political Environment	.728
infrastructure	.729

Sources: SPSS Survey/2021

As shown in the above table, the Alpha coefficient for this study for the overall scale calculated as a reliability indicator is 0.76.2. As described by Schrepp (2020) the values of Cronbach's alpha around 0.7 is classified as good. The alpha values in this study both the independent and the overall attribute are above 0.76.2 and therefore it is conclude to be good.

Table 3.2: Reliability Test Statistics

Cronbach's Alpha	N of Items
0.762	**11**

Sources: SPSS Survey/2021

The above table shows that the average of Cronbach's alpha value of all our variables, which is 0.762 (76.2%). Cronbach's alpha above 70% indicates the reliability of our data. Hence, since 76.2% greater than 70%; the researcher concludes that the data used for this study is reliable.

CHAPTER FOUR

RESULTS & DISCUSSIONS

4.1. Introduction

This chapter deals with analysis of the finding and discussion of the result in order to achieve research objectives and set a base for conclusion. This chapter presents the study findings of the Determinants of Agricultural Project Credit Default in Commercial Bank of Ethiopia: A Study in Jimma District. In this chapter discuss details of demographic profile of the respondents, normality test or normal distribution of data, descriptive statics, correlation between variables and present the regression result of the factors that influence agricultural project credit default. Section 4.1 presents the descriptive statistics. Section 4.2 discusses the correlation between variables. Section 4.3 presents the regression results of the factors that determinant of Agricultural Project Credit Default in Commercial Bank of Ethiopia Jimma District.

4.1.1. Descriptive Analysis

The summary of descriptive has shown statistics that was intended to give general description about the dependent variable and independent variables. The dependent variable is Agriculture project credit default and independent variables such as Project Credit management, Credit appraisal, Credit policy and procedural attributes of the bank, Economic environment, Bank industry, Credit Origination, Workout loan, Political environment, Economic environment, character of the borrower and infrastructure. A descriptive analysis includes mean, medium, minimum value and maximum value of each predictor.

Table 4.1: Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Agricultural Project Credit Default	65	.30	.60	.4526	.10958
Credit Policy & Procedural Attributes of the Bank	65	.12	.60	.3301	.07761
Credit Origination	65	.12	.70	.3957	.13826
Credit Appraisal	65	.22	.40	.3236	.05585
Project Credit Management	65	.52	.70	.6244	.05619
Workout Loan	65	.30	.70	.5255	.11327
Character of the Borrower	65	.49	.67	.5990	.04121
Bank Industry	65	.00	.70	.4938	.17118
Economic Environment	65	.43	.82	.6631	.09667
Political Environment	65	.18	.70	.5517	.12234
Infrastructure	65	.30	.70	.5465	.11443
Valid N (listwise)	65				

Sources: SPSS Survey/2021

Descriptive statistics stand for the conversion of raw data into useful information, that tabulate summarize format (arranging data in table, Min, Max, central tendency (mean and standard deviation). They represent one of the most important early stages of statistical data analysis. This form of statistical analysis can include a number of outputs, including frequencies, percentages, means and standard deviation.

4.2. Correlation Matrix Between Explained and Explanatory Variables

Correlation is a way to index the degree to which two or more variables are associated with or related to each other. The sample size is the key element to determine whether or not the correlation coefficient is different from zero/statistically significant. The values of the correlation coefficient are always between -1 and +1. A correlation coefficient of +1 indicates that the two variables are perfectly related in a positive linear sense; while a correlation coefficient of -1 indicates that two variables are perfectly related in a negative linear sense. A correlation coefficient of 0, on the other hand indicates that there is no linear relationship between two variables (Brooks, 2008). The correlation matrix in table 4.5 predicts the likely relationship among variables in the study. (Cooper and Schindler, 2009) state that all correlation coefficient variables which have more than 0.8 should be corrected because of multi co-linearity problem. (Masher, 2007) argued that correlation coefficient of 0.75 can be correlation coefficient of explanatory variables. Therefore, in this study there is no explanatory variable which is more than 0.75 correlation coefficients. So, there is no multi co-linearity problem.

Table 4.2: Correlation Matrix of the Dependent and Independent Variables

ITEMS	APCD	CPPA	CO	CA	PCM	WL	CB	BI	EE	PE	IS
APCD	1.000										
	.										
CPPA	.297*	1.000									
	.016	.									
CO	.065	.177	1.000								
	.604	.158	.								
CA	-.268*	.068	.376**	1.000							
	.031	.590	.002	.							
PCM	.038	.158	.584**	.048	1.000						
	.764	.210	.000	.707	.						
WL	-.201	.080	.141	.161	.149	1.000					
	.108	.528	.263	.200	.235	.					
CB	.129	.290*	.370**	.308*	.369**	.410**	1.000				
	.307	.019	.002	.012	.002	.001	.				
BI	.397**	.395**	.117	.196	.009	.169	.442**	1.000			
	.001	.001	.354	.117	.942	.178	.000	.			
EE	.271*	.169	.489**	.370**	.532**	.255*	.445**	.292*	1.000		
	.029	.178	.000	.002	.000	.040	.000	.018	.		
PE	-.067	.165	.230	.468**	.129	.250*	.298*	.298*	.580**	1.000	
	.596	.190	.066	.000	.307	.045	.016	.016	.000	.	
IS	-.130	-.216	.410**	.504**	.297*	.407**	.387**	.177	.580**	.502**	1.000
	.302	.084	.001	.000	.016	.001	.001	.159	.000	.000	.

**Correlation is significant at the 0.01 level
*Correlation is significant at 0.05
Whereas:

APCD =Agriculture Project Credit Default, CPPA=Credit Policy and Procedural Attributes of the Bank, CO= credit origination, CA= Credit Appraisal, PCM= Project Credit Management, WL = Workout Loan, CB = Character of Borrower, BI= Bank Industry, EE = Economical Environment, PE = Political Environment and IS = Infrastructure.

Some Predictors are positively and negatively correlated with the dependent variable (agriculture credit default) for example the independent variables strongly positively correlated are credit policy and procedural attributes of the bank 0.297, credit origination 0.065,credit management 0.38, credit borrower 0.129, Bank industry 0.397 and Economic

environment. Negative correlation of independent variables with dependent variables are Credit Appraisal -0.268, Workout loan -0.201, Political environment -0.067 and infrastructure -0.130. Generally positive sign shows that with increase in one variable, other variables increases as well, while negative correlation indicates that with an increase in one variable, the other variables decreases. However, the value itself provides an indication of the strength of relationship among dependent variable and independent (Explanatory variables).

4.3. Multicollinearity Test

Multicollinearity refers to the case in which two or more explanatory variables in the regression model are highly correlated and make it difficult to isolate their individual effects on the dependent variable. Using variance inflator factor (VIF) test, the mean of variance inflator factor is below ten, which is 4.77. Therefore, is no Multicollinearity problem in the model that is the rule of thumb, which says if VIF < 10, the model does not have Multicollinearity problem meaning no exact linear relationship exists between any of the explanatory variables used in the study. (Refer table 4.6 below).

Table 4.3: Multicollinearity Test by using variance inflator factor (VIF)

Variable	Collinearity Statistics	
	Tolerance	VIF
Credit Policy and Procedural Attributes of the Bank	0.150852	6.629
Credit Origination	0.931966	1.073
Credit Appraisal	0.118008	8.474
Project Credit Management	0.268962	3.718
Workout Loan	0.151263	6.611
Character of the Borrower	0.37679	2.654
Bank Industry	0.136295	7.337
Economic Environment	0.185014	5.405
Political Environment	0.283447	3.528
Infrastructures	0.442087	2.262
Average of VIF		**4.77**

Source: SPSS Output from Survey Data/2021

4.4. Model Fitting Information and Goodness-of-Fit

Model fitting information and Goodness-of-Fit are detail explain as follows:

Table 4.4: Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	73.598			
Final	**56.661**	**78.420**	**10**	**.000**

Source: SPSS Output survey/2021

Model fitting information need to know whether the data used are meet our model or not. In this case the p-value less than 0.05, therefore our data fit for the model I use. The null hypotheses rejected it means that significant difference between base line model and final model. .

Table 4.5: Goodness -of - Fit

	Chi-Square	df	Sig.
Pearson	73.598	58	**0.081**
Deviance	56.661	58	**0.525**

Source: SPSS Output from Survey Data/2021

The goodness of Fit table contains the Deviance and Pearson Chi-square test, which are useful for determining whether a model exhibits good fit to the data. Non-significant test result is indicators that the model fits the data well (Field, 2018; Petrucci, 2009). In this case both Pearson chi-square test and deviances test 0.81 and 0.525 of p-value respectively were both are insignificant. The result fits the model well.

4.5. Ordinal Logit Regression Analysis Results

A regression technique is used to assess the strength of a relationship between a dependent variable and independent variables. It helps in predicting value of dependent variable from one or more independent variables. Regression analysis

helps in predicting how much variance is being accounted in a single response (dependent variable) by a set of independent variables.

Table 4.6: Ordinal Regression Coefficient Analysis

Variables	Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
APCD	1247.930	356.163	12.277	1	.000	-1945.997	-549.864
CPPA	35.565	9.909	12.883	1	.000	16.145	54.986
CO	-1.918	3.805	.254	1	.614	-9.376	5.541
CA	4216.741	1203.772	12.271	1	.000	1857.391	6576.091
PCM	-4197.632	1196.208	12.314	1	.000	-6542.156	-1853.108
WL	4.071	4.439	.841	1	.359	-4.630	12.772
CB	-28.275	13.958	4.103	1	.043	-55.632	-.917
BI	6.548	3.796	2.975	1	.085	-.892	13.988
EE	35.725	10.600	11.358	1	.001	14.949	56.501
PE	-19.504	7.060	7.631	1	.006	-33.342	-5.666
IS	-13.451	4.697	8.200	1	.004	-22.657	-4.245

Source: SPSS Output survey/2021

Credit Policy and Procedural Attributes of the Bank (CPPA is statistically significant positive predictor of Agricultural Project Credit Default. That is, for every one unit increase in CPPA, there is a 35.656 increment in agricultural project credit default in the logs odds. This indicates that the change in agricultural project credit default scoring higher than the change in credit policy and procedural attributes of the bank. The explanatory variable was statistically significant in influencing Agricultural Project Credit Default in Commercial Bank of Ethiopia, Jimma District. The coefficient having positive sign is significant at 5 percent level of significance suggesting that 1 unit increase in CPPA leads to 35.656 increase in Agricultural Project Credit Default on the average.

Credit Appraisal (CA) is also positive statistical significant predictor of agriculture project credit default. For every one unit increase in credit appraisal; there is a 4216.741increment in agricultural project credit default in log odds. Credit appraisal meaning lack of credit appraisal and evaluation parameters, weak credit assessment on

the market, technical, economic & environment of feasibility study, overestimation of expected returns, lack of prudent lending practices and problem of under financing/over financing that leads toincrease in Agricultural Project Credit Default. The finding is consistent with previous findings of Fikirte (2015) and McConnell (2010).

Project Credit Management (PCM) is a negative statistically significant predictor of agriculture project credit default. For every one unit increase in managing project credit in well manner; there are 4216.741decreases in agricultural project credit default in log odds. Project credit management mean that periodic visits of agricultural project sites, strictly follow-up and tight monitoring of agricultural project credit that leads to decrease in agricultural project credit default.

Character of Borrowers is a negative statistically significant predictor of agriculture project credit default. For every one unit increase in good character of the borrower; there are 28.275 decreases in agricultural project credit default in log odds. Character of the borrower mean that diversion of fund, wilful defaulter, lack of integrity, unwillingness & Carelessness to repay the debt, lack of commitment, unplanned & ambitious business expansion, lack of enough knowledge & experience to the granted loan, poor feasibility study, poor working capital management and delay of project implementation period that leads to increase in agricultural project credit default. The finding is consistent with previous studies undertaken by Fikirte (2015), Adamu (2013) and Birhanu and Fufa (2008).

Economic Environment (EE) is positive statistically significant predictor of agriculture project credit default. For every one unit increase in Economic Environment; there is a 35.725 increment in agricultural project credit default in log odds. Economic environment meaning inflation, unstable & unpredictable market situation, exchange rate fluctuation and increase in labor cost that leads to increase in agricultural project credit default. The finding is consistent with previous findings of Adamu (2013).

Political Environment (PE) is a negative statistically significant predictor of agriculture project credit default. For every one unit increase in good political environment; there are

19.504 decreases in agricultural project credit default in log odds. Political environment meaning stable political security and paying enough compensation for the farmers those who release their land for investment expansion that leads to decrease in agricultural project credit default. The finding is consistent with previous findings of Fikirte (2015) and Adamu (2013).

Infrastructure (IS) is a negative statistically significant predictor of agriculture project credit default. For every one unit increase in infrastructural facility; there is 13.451 decreases in agricultural project credit default in log odds. Infrastructure meaning availability of road access to project site, enough transport facility, access to water supply, information communication & access to electric utilitythat leads to decrease in agricultural project credit default. The finding is inconsistent with previous findings of Fikirte (2015).

CHAPTER FIVE
CONCLUSIONS AND POLICY IMPLICATIONS

5.1. Conclusions

The objective of this research was to identify the major determinants of project loan default in general and specifically factors in connection with bank specific, borrower specific and external factors. To achieve this objective, the study used qualitative and quantitative research approach. The data was collected from credit performers those who are directly or indirectly participated in agricultural credit process through structured questionnaire.

To check for the reliability of the data, the researcher has used Cronbach's-Alpha test and all the data were reliable. Then, the researcher has also checked the correlation between dependent variable and explanatory variables by using correlation matrix and confirmed that there are correlation between dependent and independent variables. The test of normality has undertaken to determine the regression model by using Kolmogorov-Smirnov, Shapiro-Wilk as well as Histogram and the test has shown that the data were not normally distributed around the mean. Hence, the researcher has used Ordinal Logit Regression Model rather than linear regression model after checked for model fittings/Goodness-of-fit by using Pearson and Deviance test of goodness-of-fit and confirm that the model is well fit.

The findings of the study indicated that the credit policy and procedural attributes of the bank, credit appraisal, project credit management, character of the borrower, economic environment, political environment and infrastructural have significant impact on agricultural project credit default while credit origination, workout loan and banking industry have insignificant impact on credit default.

The major causes of agricultural project credit default are factors in connection with borrower specific that is character of the borrower. One of the creditworthiness criteria is

character of the borrower. So, fund diversion, willful defaulter, unwillingness and carelessness to repay the debt, lack of commitment, unplanned and ambitious business expansion, lack of understanding to manage the project, lack of enough knowledge and experience to use the granted loan properly, preparing poor feasibility study, poor working capital management and delay of the project implementation period, which expose to agricultural project credit default. These factors all are related to character of the borrower that leads agricultural project credit default.

The other factor is bank specific factor that leads to agricultural project credit default. These factors are credit policy and procedural attributes of the bank that constitutes rain fed agricultural policy and procedural bottlenecks of the bank. Credit appraisal is also the factor that contributes to agricultural project credit default. It constitutes sub factors such as weak credit assessment on the market, technical, economic and environmental feasibility of the project, overestimation of expected returns from the project that may leads over or under-financing of the project. Under financing leads to failure of the project while over financing leads the borrower to unplanned and ambitious business expansion and finally leads to loss. Project credit management is the other factor the leads to agricultural project credit default. Factors related to project credit management are lack of periodic visit of agricultural project with good frequency, lack of strict follow up and lack of tight credit monitoring.

External factors that contribute to agricultural project credit default are economic environment. This factor constitutes macro-economic variables such as inflation (increase in general price level), unstable and unpredictable market situation in the country and exchange rate fluctuation and increase in labor cost. Political environment is the other external factor that constitutes other sub-factors such as security problem and unfair compensation payment for the farmers those who release land for investment expansion. Infrastructure is also factor for successfulness of agricultural project. If there is no road access to project/farm site/, it is difficult transport their products to the market. Even, it is

difficult to transport laborers to the farm site from other place to harvest the production at peak season.

5.2. Recommendations

In line with financing of agricultural project, the Bank shall provide detailed professional advice to the project promoter on; how to use the loan granted, the importance of understanding and using the feasibility study, hire qualified and experienced management for the project as well as the business, and the cost of not implementing the project within the planned schedule.

The Bank shall establish well organized information system to gather and maintain up-to-date information about the market condition of agricultural sector so that the credit performers easily access up-to-date information to appraise the agricultural project in well manner and reduce the risk of agricultural project credit default.

The Bank shall forecast and consider the effect of economic environment in forecast of total project cost and revenue during project appraisal stage and cost of goods effectively while appraising the project. Hence, it shall avoid any shock and prepare a risk mitigating mechanisms to sustain the project.

The Bank shall put in place strong monitoring and follow-up mechanisms, such as physical follow-up, financial follow-up and legal follow-up as well as frequently visiting the project site and maintaining good communication with the borrower about the use of fund and the project's performance.

The Bank shall alert to understand early warning signals and give remedial action before the major problem is happened that is to be proactive active to the agricultural project credit rather than reactive to Non-Performing Loan.

The project promoters should discharge their social responsibility around the project site for the wellbeing of the society those who release their land for investment purpose so as to minimize societal unrest in the area and also use the project fund only for intended purpose, retain themselves from unplanned and ambitious project expansion, present well prepared feasibility study by the professional consultant before starting the project, try to implement the project within the time scheduled to minimize cost overrun, increase integrity and openness to the bank to help as well as to be helped, have commitment to repay the debt by eradicating carelessness behavior, learning to management project fund and managing the credit.

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APPENDICES

APPENDIX –A

JIMMA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
MA IN PROJECT MANAGEMENT AND FINANCE

Questionnaire Assess the Determinants of Agricultural Project Default in Commercial Bank of Ethiopia: A study in Jimma District

Dear Respondents,

This questionnaire is prepared to collect data from Commercial Bank of Ethiopia Jimma District Credit Performers to undertake thesis paper for partial fulfillment of MA in Project Management and Finance on the title 'Determinant of Agricultural Project Credit Default in Commercial Bank of Ethiopia: A Study in Jimma District'. The information you provide will be used only for academic purpose and I also assure you that all your responses will be kept strictly confidential.

I kindly request you to respond freely and honestly as your response has great value in a study to be undertaken. Thank you, for your cooperation and response in advance.

General Direction:

- You are not required to write your name
- Please put (√) mark in the box that best describes your response
- Write your opinion on the blank space provided and for some items you can use other sheets of paper if the space provided is not sufficient.

Part I: General Information of Respondents

1. Age: < 20 ☐ 21-30 ☐ 31-40 ☐ 41-50 ☐ >50 ☐
2. Gender Male ☐ Female ☐
3. Educational level: Diploma ☐ 1st Degree ☐ 2nd Degree ☐ PhD ☐
4. Years of service in the bank:
   1-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ > 20 ☐
5. Job position:
   District Director ☐ Credit Management Manager ☐
   Credit Appraisal Manager ☐ Customer Relationship Manager ☐
   Credit Appraisal Expert ☐ Credit Appraisal Officer ☐
   Credit Administrator ☐ Customer Relationship Officer ☐ Branch Manager ☐

Part II: Detail Information about Project Credit in CBE

S/N	Description	Strongly agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
Agricultural Project Credit Default						
1	There is no credit quality assessment of the bank periodically					
2	The bank is reactive to project credit default					
3	The bank does not flexible with the market change during appraising agricultural project credit					
Bank Specific Factors for Agricultural Credit Default						
	Credit Policy and Procedure Attributes of the bank					
1	CBE's lending interest rate adequately contributes to the increment of agricultural project credit default					
2	CBE's financing policy of rain feed agriculture brought the increment of agricultural project credit default.					
3	CBE's Procedural bottleneck has paramount contribution to agricultural project credit default.					
	Credit Origination					
1	Poor due diligence assessment leads to agricultural project default					
2	Weak credit negotiation with the borrower about the purpose of the loan and installment modalities are the factors for agricultural project credit default					
3	Inadequate collateral or equity contribution made by the project promoter is the factors for agricultural project credit default.					
	Credit Appraisals					
1	CBE's project appraisal and evaluation parameters are in a very genuine and in good manner to provide achievement of project realization					
2	Weak credit assessment on the market, technical, economic and environmental feasibility of the project leads to project credit default.					
3	Over estimation of expected returns from project leads to increase agricultural project credit default.					

4	The bank uses modern credit evaluation criteria in agricultural project appraisal					
5	There is prudent lending practice in CBE					
6	There is the problem of under/over finance of agricultural project in CBE					
	Project credit management					
1	There are no periodic visits of agricultural projects with good frequency.					
2	Lack of strict agricultural project credit follow up leads to default					
3	Lack of tight credit monitoring					
	Workout Loan					
1	Lax loan workout procedures contributes default					
2	Inconvenient workout strategy to resolve the agricultural project credit default.					
3	Poor negotiation skill of the workout loan officer leads to credit default					
Borrowers Related Factors Contributes to Credit Default						
Character of the Borrower/Project Promoter						
1	There is diversion of fund in agricultural project credit by the borrowers that leads to default					
2	Agricultural project credit customers are willful defaulter					
3	Lack of Integrity of the borrower					
4	Unwillingness and carelessness of the customer to repay the debt					
5	Lack of commitment by the project promoter					
6	Un-planned and ambitious business expansion leads to default					
7	Lack of understanding of the project by the project promoter					
8	Lack of enough knowledge & experience how to use the granted loan					
9	Poor feasibility study presented by the project promoter					

10	Poor working capital management by the borrower					
11	Delay of the project in implementation period and the associated cost overruns that leads to agricultural project default					
External Factors that contributes to Agricultural Project Credit Default						
Banking Industry						
1	Poor credit culture in the country					
2	Unfair competition among banks					
Economic Environment						
1	Increase in general price level (Inflation) has significant impact on agricultural project credit default.					
2	Unstable and unpredictable market situation in the country is factor for increase in agricultural project credit default					
3	Exchange rate fluctuation leads to default in agricultural project credit					
4	Increase in labor cost leads to agricultural project credit default					
Political Environment						
1	Agricultural project credit is defaulted due to security problem					
2	Unfair payment of compensation for the farmers may contribute to agricultural project credit default					
Infra Structures						
1	Lack of transport facility					
2	Lack of road access to project site					
3	Lack of water supply					
4	Lack of Information Technology (communication)					
5	Lack of Electric Power Utility					

Please state any opinion, suggestions or comments, which you think that it is very essentials for the improvement of agricultural credit default rate in CBE.

_____

_____

_____

Thank You in Advance for Your Response!

APPENDIX -B

1. Reliability Test

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	65	100.0
	Excluded[a]	0	.0
	Total	65	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.762	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Agricultural Project Credit Default	33.9723	19.034	.144	.774
Credit Policy & Procedural Attributes of the Bank	34.7214	18.738	.414	.749
Credit Origination	34.2698	16.692	.365	.754
Credit Appraisal	34.7718	19.056	.566	.749
Project Credit Management	32.6497	17.816	.517	.737
Workout Loan	33.4388	17.626	.338	.753
Character of the Borrower	32.9060	18.519	.579	.742
Bank Industry	33.5723	17.022	.280	.770
Economic Environment	32.1825	13.804	.764	.685
Political Environment	33.2108	16.079	.530	.728
Infra Structures	33.2585	15.867	.522	.729

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
36.8954	20.441	4.52122	11

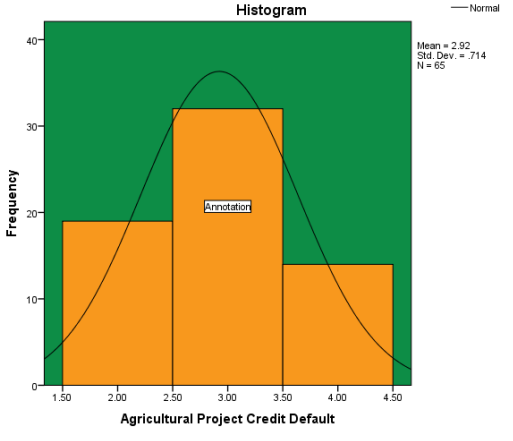
2. Multicollinearity Test

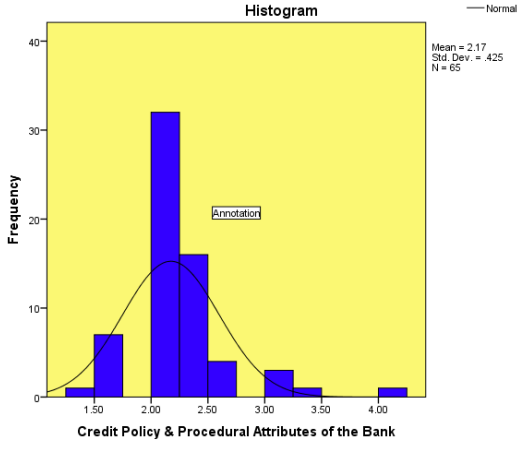
Coefficients[a,b]

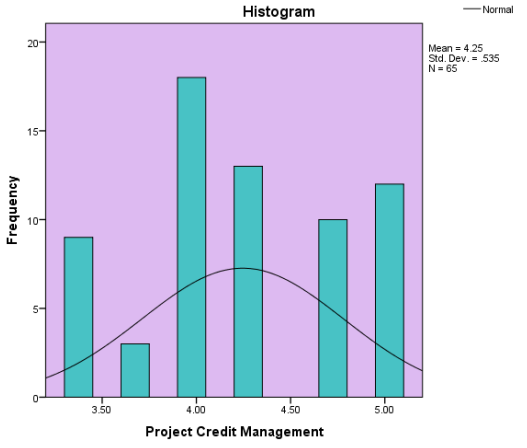
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Co-linearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	Credit Policy and Procedure	.146	.124	.072	1.174	.245	.150852	6.629
	Credit Origination	.357	.140	.322	2.547	.014	.931966	1.073
	Credit Appraisal	.337	.079	.273	4.241	.000	.118008	8.474
	Project Credit Management	.223	.080	.202	2.770	.008	.268962	3.718
	Workout Loan	.014	.083	.010	.171	.865	.151263	6.611
	Character of Borrowers	.322	.097	.284	3.310	.002	.37679	2.654
	Banking Industry	.154	.100	.120	1.537	.130	.136295	7.337
	Economic Environment	-.263	.111	-.212	-2.379	.021	.185014	5.405
	Political Environment	-.101	.096	-.091	-1.045	.301	.283447	3.528
	Infrastructure	.042	.099	.035	.428	.670	.442087	2.262

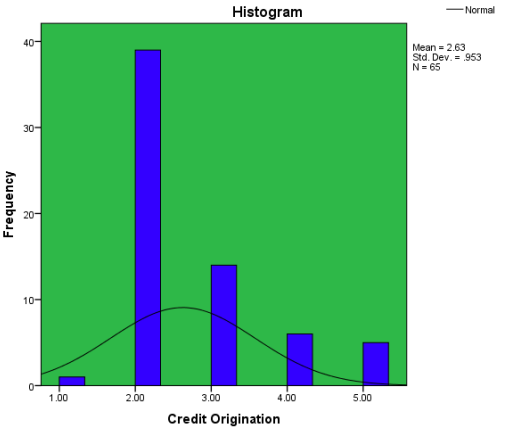
a. Dependent Variable: agricultural project credit default

b. Linear Regression through the Origin






Histogram
Normal
Mean = 4.25
Std. Dev. = .535
N = 65
Frequency
Project Credit Management


Histogram
Normal
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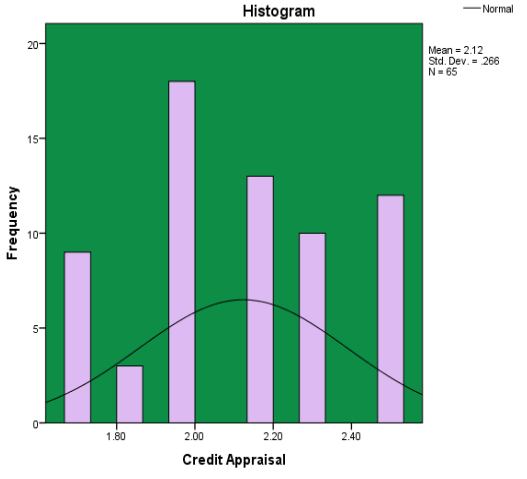
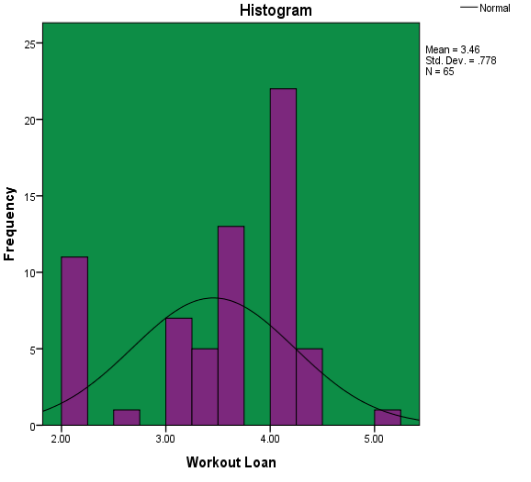
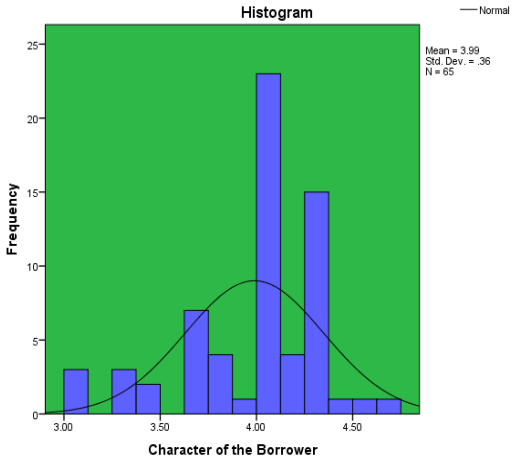
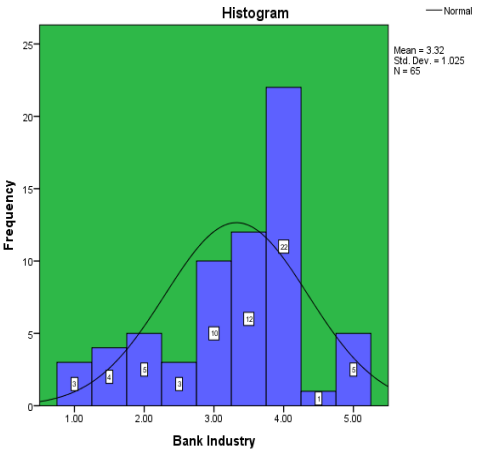
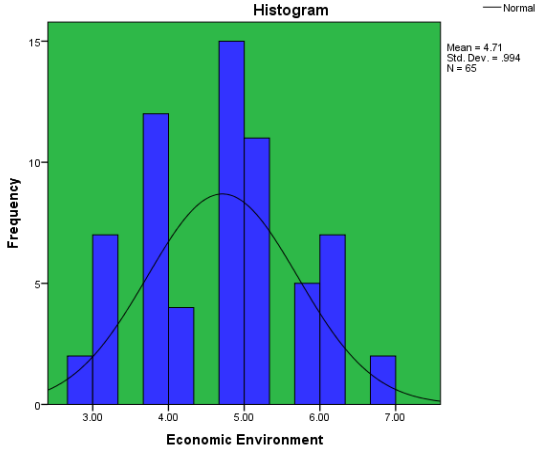
Std. Dev. = .953
N = 65
Frequency
Credit Origination

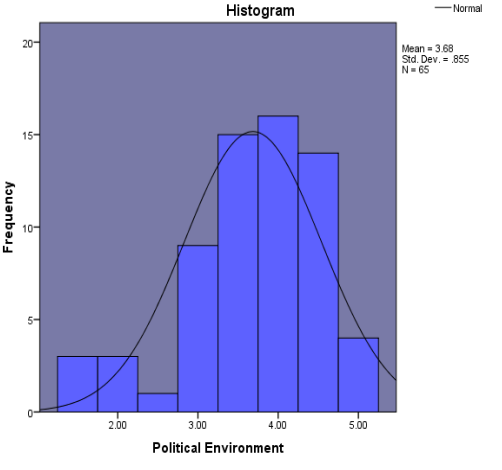

Histogram
Normal
Mean = 2.12
Std. Dev. = .266
N = 65
Frequency
Credit Appraisal

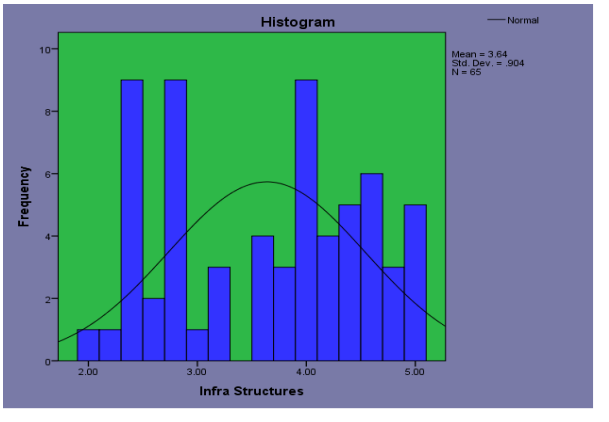

Histogram
Normal
Mean = 3.46
Std. Dev. = .778
N = 65
Frequency
Workout Loan


Histogram
Normal
Mean = 3.99
Std. Dev. = .36
N = 65
Frequency
Character of the Borrower


Histogram
Normal
Mean = 3.32
Std. Dev. = 1.025
N = 65
Frequency
Bank Industry


Histogram
Normal
Mean = 4.71
Std. Dev. = .994
N = 65
Frequency
Economic Environment


Histogram
Normal
Mean = 3.68
Std. Dev. = .855
N = 65
Frequency
Political Environment


Histogram
Normal
Mean = 3.64
Std. Dev. = .904
N = 65
Frequency
Infra Structures

3. Correlation Matrix

	APCD	CPPA	CO	CA	PCM	WL	CB	BI	EE	PE	IS
APCD	1.000	.297*	.065	-.268*	.038	-.201	.129	.397**	.271*	-.067	-.130
	.	.016	.604	.031	.764	.108	.307	.001	.029	.596	.302
CPPA	.297*	1.000	.177	.068	.158	.080	.290*	.395**	.169	.165	-.216
	.016	.	.158	.590	.210	.528	.019	.001	.178	.190	.084
CO	.065	.177	1.000	.376**	.584**	.141	.370**	.117	.489**	.230	.410**
	.604	.158	.	.002	.000	.263	.002	.354	.000	.066	.001
CA	-.268*	.068	.376**	1.000	.048	.161	.308*	.196	.370**	.468**	.504**
	.031	.590	.002	.	.707	.200	.012	.117	.002	.000	.000
PCM	.038	.158	.584**	.048	1.000	.149	.369**	.009	.532**	.129	.297*
	.764	.210	.000	.707	.	.235	.002	.942	.000	.307	.016
WL	-.201	.080	.141	.161	.149	1.000	.410**	.169	.255*	.250*	.407**
	.108	.528	.263	.200	.235	.	.001	.178	.040	.045	.001
CB	.129	.290*	.370**	.308*	.369**	.410**	1.000	.442**	.445**	.298*	.387**
	.307	.019	.002	.012	.002	.001	.	.000	.000	.016	.001
BI	.397**	.395**	.117	.196	.009	.169	.442**	1.000	.292*	.298*	.177
	.001	.001	.354	.117	.942	.178	.000	.	.018	.016	.159
EE	.271*	.169	.489**	.370**	.532**	.255*	.445**	.292*	1.000	.580**	.580**
	.029	.178	.000	.002	.000	.040	.000	.018	.	.000	.000
PE	-.067	.165	.230	.468**	.129	.250*	.298*	.298*	.580**	1.000	.502**
	.596	.190	.066	.000	.307	.045	.016	.016	.000	.	.000
IS	-.130	-.216	.410**	.504**	.297*	.407**	.387**	.177	.580**	.502**	1.000
	.302	.084	.001	.000	.016	.001	.001	.159	.000	.000	.

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

4. PLUM - Ordinal Regression

Case Processing Summary

		N	Marginal Percentage
Agricultural Project Credit Default	.30	19	29.2%
	.48	32	49.2%
	.60	14	21.5%
Valid		65	100.0%
Missing		0	
Total		65	

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	73.598			
Final	56.661	78.420	10	.000

Link function: Logit.

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	73.598	58	.081
Deviance	56.661	58	.525

Link function: Logit.

Pseudo R-Square

Cox and Snell	.701
Nagelkerke	.801
McFadden	.581

Link function: Logit.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Log_APCD = .30]	-1254.071	357.291	12.320	1	.000	-1954.349	-553.793
	[Log_APCD = .48]	-1247.930	356.163	12.277	1	.000	-1945.997	-549.864
Location	Log_CPPA	35.565	9.909	12.883	1	.000	16.145	54.986
	Log_CO	-1.918	3.805	.254	1	.614	-9.376	5.541
	Log_CA	4216.741	1203.772	12.271	1	.000	1857.391	6576.091
	Log_PCM	-4197.632	1196.208	12.314	1	.000	-6542.156	-1853.108
	Log_WL	4.071	4.439	.841	1	.359	-4.630	12.772
	Log_CB	-28.275	13.958	4.103	1	.043	-55.632	-.917
	Log_BI	6.548	3.796	2.975	1	.085	-.892	13.988
	Log_EE	35.725	10.600	11.358	1	.001	14.949	56.501
	Log_PE	-19.504	7.060	7.631	1	.006	-33.342	-5.666
	Log_IS	-13.451	4.697	8.200	1	.004	-22.657	-4.245

Link function: Logit.

Test of Parallel Lines[a]

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	56.661			
General	96.452[b]	.[c]	10	.

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.

a. Link function: Logit.

b. The log-likelihood value cannot be further increased after maximum number of step-halving.

c. The log-likelihood value of the general model is smaller than that of the null model. This is because convergence cannot be attained or ascertained in estimating the general model. Therefore, the test of parallel lines cannot be performed.