*Majors: FINANCE*
*Major No. F24*

# FACTORS AFFECTING CREDIT RISK, STUDY OF COMMERCIAL BANKS IN PAKISTAN


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**Fall – 2022**

# FINAL PROJECT/THESIS APPROVAL SHEET

**Viva-Voce Examination**

Viva Date 06 / 02 / 2023

**Topic of Research:** Factors Affecting Credit Risks, Study of Commercial Banks in Pakistan

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# Abstract

The aim of our research project is to investigate the effectiveness of credit risk management in commercial banks and to identify the factors that influence it. In addition to describing the target audience for the study and the sources of data used, we will discuss the methodology used to analyze the data. The study employed both descriptive and multiple regression analysis methods to identify the key factors and their impact on credit risk management. Based on the descriptive statistics, a large number of respondents from the banking sector were unsatisfied with the credit application, credit approval, and credit information processes, while acknowledging the effective implementation of monitoring and follow-up processes. Correlation analysis indicated a significant relationship between credit risk management factors and effectiveness. The results of the multiple regression analysis indicated that credit information, credit approval, credit disbursement, monitoring, and follow-up had a positive and significant impact on the efficiency of credit risk management in commercial banks. To enhance their credit risk management system, banks should prioritize these elements, according to the study's recommendations.

**Keywords:** Credit risk, Factor analysis, Panel data, Evidence-based research, Financial stability, Risk management, Credit scoring, Macroeconomic variables, Regression analysis

# Acknowledgement

First and foremost, I would want to express my sincere gratitude to Almighty Allah (s.w.t) for His love and support I received throughout my life and provided me the ability to think, work and overcoming any obstacles that my life may present. I would want to express my gratitude for Dr. Shahab's efforts, who has demonstrated his devoted commitment to the completion of this proposal report by teaching important thing on how to perform research, how to collect and analyze the data and most importantly how to use some handy softwares like Smart PLS. All of these thing have made my journey on writing this research piece a lot easier. His professional guidance, overwhelming attitude and full support has made this proposal possible for me to write and understand. Furthermore, I want to express my gratitude to my friends and family for their love and support throughout my life, especially to my parents who are my strongest support. My family is the main factor in my achievement thus far in my academic career. I would also thank my others teachers who taught me so well that I can able to learn something in this degree which can help me in career as well. Because of them I learned the exact things for which I came here in this university.

***Dedicated to my mother.***

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# CHAPTER 1: INTRODUCTION

## 1.1 Background

The inability of a borrower to repay a loan or uphold contractual obligations constitutes credit risk, which is defined as the possible loss that could result. To maintain the stability of financial institutions, credit risk management is a critical component in the framework of banking and finance.

Credit risk can come from several different things, including loan default, fluctuating interest rates, and economic downturns. Due to the complexity of financial markets and products, as well as the international nature of banking and finance, the management of credit risk has grown in importance over the past several years (Nawayseh, 2020).

Credit risk has always been controlled using common sense guidelines and prior knowledge. However, more advanced strategies for managing credit risk have been developed as a result of technological innovation and the availability of vast amounts of data. Credit scoring models, credit ratings, and stress testing are all used in this. (Sahay, Allwen, Lahreche, & Khera, 2020).

The Basel II and Basel III frameworks, which were designed by the Basel Committee on Banking Supervision, are also used to control credit risk (Nawayseh, 2020).. To make sure that banks and other financial institutions have enough resources to cover potential credit losses, these frameworks specify the minimum capital requirements for those organizations.

To preserve the stability of financial institutions, credit risk must be appropriately managed as a critical component of banking and finance. Due to the growing complexity of financial markets and products as well as the increasingly global character of banking and finance, the management of credit risk has gained importance in recent years (Sahay, Allwen, Lahreche, & Khera, 2020).

### 1.1.1 Factors Affecting Credit Risk

Credit risk is the likelihood that a borrower will not make their loan payment or will not return the debt on time. Some factors, including a change in the borrower's financial status, a decrease in the value of the assets pledged as collateral, or a shift in the credit market could cause this (Duffee, 1999). Banks and other financial institutions are very concerned about credit risk since it can significantly affect their stability and profitability. For instance, a high volume of loan

defaults may cause banks to suffer substantial losses as well as a decline in investor and consumer confidence. Additionally, credit risk can impact the whole financial system's stability (Ozili & Peterson, 2020).

Banks and other financial organizations have developed several credit risk management strategies to lessen the impact of credit risk on their stability and profitability. Credit derivatives, credit ratings, and credit scoring are some of these, along with more sophisticated risk management strategies like value at risk (VAR) and credit value at risk (CVAR) analyses. To evaluate a borrower's creditworthiness and estimate the risk of default, credit scoring and credit ratings are frequently utilized (Fu & Mishra, 2021). Credit derivatives are used to shift credit risk from one party to another, such as credit default swaps. Credit risk management for a portfolio is done using VAR and CVAR analysis.

Credit risk is influenced by several variables, including financial ratios, macroeconomic indicators, and firm-specific characteristics. Financial ratios, such as the debt-to-equity ratio, and the current ratio, are frequently used to assess a company's financial standing and capacity to pay back its loans. As an illustration, a high debt-to-equity ratio suggests greater leverage, which might raise the risk of default. In a similar vein, a low current ratio, which assesses a company's capacity to satisfy its short-term liabilities, may point to a higher default risk (Alberto, Chaia 2010).

Credit risk can also be influenced by macroeconomic factors like GDP and inflation. For instance, a decline in a company's ability to earn income during a recession or a time of high inflation may increase the risk of default. Similar to how rising borrowing costs can increase the chance of default, rising interest rates can do the same.

Credit risk can also be impacted by factors that are specific to a company, like size and industry Kaminsky et al. (2001). For instance, businesses in some sectors, like construction and real estate, are more vulnerable to changes in the economy and may thus be in danger of default (Novokreshchenova et al. 2016).

There is a growing corpus of empirical data on the relationship between credit risk and these parameters, which has been thoroughly researched in the literature. To fully comprehend the connection between credit risk and these parameters, additional research is required as there are still gaps in the literature. Recent IEEE standards references, such as: are recommended for scholars and practitioners to better comprehend these issues.

Overall, research on the variables that affect credit risk is crucial for the banking and financial sector since it can offer valuable information for credit risk management and regulatory strategy. Banks and financial institutions can better manage their credit risk and create efficient strategies to lessen its impact on their profitability and stability by understanding the elements that determine credit risk. For instance, banks can take measures to lessen their exposure to risk by identifying businesses that are more likely to default. Additionally, regulatory authorities can better create policies to support financial stability by understanding the elements that influence credit risk. For instance, regulatory organizations can take action by identifying sectors that are more likely to default (Kumar, Tiwari, & Zhymber, 2019) .

### 1.1.2 Credit Risk Management

Credit risk management is the process of identifying, assessing, and managing the potential for financial loss from the failure of a borrower to repay a loan or meet other obligations as agreed. It is a critical function for banks and financial institutions, as it helps to mitigate the impact of credit risk on their profitability and stability (Kirk and Miller, 1986). Credit risk management typically involves several key steps, including:

- Credit risk identification: This entails locating potential credit risks sources, such as loans, bonds, and other financial instruments.
- Credit risk assessment: This entails assessing the likelihood and potential consequences of credit risk for the institution. Financial ratios, credit rating models, and other analytical tools can be used to do this.
- Credit risk management: This is putting strategies in place to lessen or control credit risk, such as establishing credit limits, diversifying loan portfolios, and putting risk management procedures in place.
- Banks and other financial organizations frequently utilize big data analytics and other data-driven techniques, such as machine learning, to increase the efficiency of credit risk management. These methods can aid organizations in better identifying and evaluating credit risk, as well as in developing

### 1.1.3 Credit Risk in Banking

In the banking industry, credit risk refers to the possibility that a borrower would cancel their loan or fail to make the agreed-upon repayments (Creswell & Clark, 2007). This might happen

if the borrower declares bankruptcy or is unable to make their loan payments. Banks and other financial institutions are very concerned about credit risk since it can significantly affect their stability and profitability. Credit risk management consequently became crucial to the banking and financial sector (Navaretti, Calzolari, & Ponzolo, 2017) .

Credit scoring, credit ratings, and credit derivatives are just a few of the techniques that banks use to manage credit risk. Credit scoring uses statistics to determine how likely a borrower will default. Credit ratings are the perspectives of credit rating

### 1.1.4 Credit Risk Analysis

The process of determining a borrower's creditworthiness and estimating the possibility that they will not repay a loan or other financial obligation is known as credit risk analysis. Identification and measurement of a borrower's potential credit risk are the objectives of credit risk analysis, which is used to gather data for lending and investment decisions. In order for banks and other financial organizations to manage their credit risk and make better lending and investment decisions, credit risk analysis is a crucial component of the banking and finance business (Creswell, 2014).

Various analytical methods and tools, such as financial ratios, credit scoring models, and other statistical techniques, are frequently used in the examination of credit risk. Financial ratios, such as the debt-to-equity ratio and the current ratio are frequently used to assess the financial stability and debt-repaying capacity of an organization. A borrower's creditworthiness is assessed using credit scoring models, like the FICO score, based on a number of variables, including their credit history, income, and occupation. Credit risk data is analyzed and predictions regarding credit risk are made using decision trees and other statistical methods like logistic regression (Nawayseh, 2003) .

Big data and machine learning are being utilized to improve the accuracy and efficiency of credit risk assessments. For instance, banks and financial institutions can use big data and machine learning to analyze enormous amounts of data from many sources, including social media, to look for patterns and trends that could indicate credit risk ( Alber & Dabour, 2021).

Credit risk is important because it has the potential to have a big impact on the stability and profitability of banks and financial institutions. If a borrower defaults on a loan or does not repay the debt in accordance with the terms of the arrangement, lenders could sustain large losses. In

addition, a high number of borrowers defaulting on their debts runs the risk of triggering a financial crisis and harming the economy as a whole.

One example of the importance of credit risk is the financial crisis of 2008. One of the main causes of the crisis was the widespread subprime mortgage defaults brought on by banks' and financial institutions' poor credit risk management. As a result, several financial institutions, including banks, suffered significant losses, and some were forced into bankruptcy. Additionally, the crisis resulted in a severe recession, the loss of many people's wealth and jobs.

Credit risk is demonstrated by a bank lending money to a small business owner. Because it could lose money if the small business owner is unable to make loan payments, the bank is taking on credit risk. An economic downturn, the business owner making poor management choices, or unforeseen events like a natural disaster are just a few reasons why this may happen. In order to lower the credit risk, the bank could need collateral, a personal guarantee, or a strong credit rating from the borrower to (Sahay, et al., 2020).

Another illustration of credit risk is the purchase of a bond. When a person purchases a bond, they are actually giving money to the issuer, which could be a company or the government. Since there is a potential that they could lose money if the issuer is unable to make interest or principal payments on the bond, the investor is taking on credit risk. In order to lower the credit risk, the investor may choose to invest in bonds with higher credit ratings, which are regarded to have a lower possibility of default.

### 1.1.5 Credit Risk Score

A borrower is assigned a credit risk score, a number based on their creditworthiness. Usually, a combination of financial and non-financial data, such as credit history, income, and employment history, is used to establish the score. The score is used by banks and other financial organizations to determine how likely a borrower is to default on a loan or fail to make the agreed-upon repayments. The better the score, the lower the danger of default and the more likely it is that the borrower would be approved for credit or a loan (Terre Blanche, et al, 2006).

The FICO score, VantageScore, and Credit Risk Scorecard are just a few of the credit risk scoring models used in the banking and financial industries. These models use a variety of algorithms and data sources to calculate the credit risk score in an effort to provide a single, straightforward method of evaluating a borrower's creditworthiness (Kazmi, 2003).

The use of credit risk scores has developed into a vital component of the banking and finance industry since it helps banks and financial institutions to assess a borrower's credit risk quickly and effectively. A bank can quickly decide whether to approve or reject a loan application and can also determine the terms of the loan, such as the interest rate, by calculating a borrower's credit risk score. Regulatory organizations also evaluate the overall credit risk of the banking industry and identify institutions that may be more likely to default using credit risk ratings (Kanwal, 2017).

### 1.1.6 Credit Risk Assessment

Credit risk assessment is crucial because it enables banks and other financial organisations to recognize and control the possibility of loan default or failure to make agreed-upon repayments. Banks and other financial organisations can reduce the negative effects of credit risk on their stability and profitability by assessing credit risk before making a lending or investment decisions (Joppe, 2000).

For instance, by evaluating a potential borrower's credit risk, a bank might ascertain the chance of default and modify the loan's terms accordingly. For instance, the bank can demand a greater down payment or a higher interest rate if the borrower is thought to be high-risk. In a similar vein, a potential investor can examine the credit risk of an

### 1.1.7 Credit Risk and Financial Performance

Credit risk assessment, which is important for banks and financial organizations, enables the identification and control of the probability of loan default or an inability to repay debt following an agreement (IBS Intelligence 2021). By analyzing credit risk and using the results to make wise lending and investment decisions, banks and other financial institutions can lessen the effect of credit risk on their profitability and stability Mugenda (2003).

By assessing the credit risk of a potential borrower, a bank, for example, can forecast the likelihood of default and then adjust the loan's terms accordingly. If a borrower is deemed to be high risk, the bank could, for instance, demand a higher interest rate or a larger down payment. Similarly to this, a potential investor might decide how to spend their money by assessing the credit risk.

Contrarily, research showing a positive relationship between credit risk and financial success suggests that greater credit risk is associated with better financial performance. For instance, a World Bank study found that banks with higher credit risk are more lucrative as measured by return on assets (East 18 april 2019).

## 1.2 Problem Statement

Credit risk management is an essential part of the banking and finance industry since it helps to minimize potential losses and prevent financial instability. However, managing credit risk is a challenging endeavor that calls for a thorough understanding of the factors that influence credit risk. The study finds that financial ratios, macroeconomic variables, and firm-specific variables can all have an impact on credit risk. On how exactly these factors relate to credit risk, though, there is some debate. This emphasizes the need for more research to fully understand the factors that influence credit risk and to effectively manage it (Desai 2015).

Given the importance of credit risk management and the growing complexity of the banking and finance industries, it is imperative to have a thorough awareness of the factors that influence credit risk. This knowledge will help banks and other financial institutions manage their credit risk more effectively and reduce the likelihood of losses. Additionally, it will provide the information regulatory bodies need to develop financial stability-promoting policies. The objective of this thesis is to contribute to the existing body of knowledge by analyzing the factors affecting credit risk and providing a complete assessment of the link between credit risk and various financial and macroeconomic variables. This study's findings, which will be based on panel data, will provide important insights.

## 1.3 Research Objective

The main objective of this study is to use panel data to analyze the influences on credit risk. Panel data analysis is a statistical method that involves observing a group of subjects over a period of time to detect changes in their behavior. This approach is useful in examining the changes in credit risk over time, and it enables the identification of the key monetary and economic indicators that influence credit risk. By understanding these indicators, we can develop more effective strategies for managing (Lee, Kozar, & Larsen , 2003) credit risk.

In addition to examining the key monetary and economic indicators, this study also aims to explore the effects of borrower characteristics on credit risk. By analyzing characteristics such as income, education, and credit history, we can gain a deeper understanding of the factors that contribute to credit risk. This information is valuable for banks and other financial institutions when they are assessing the creditworthiness of potential borrowers (Marangunic & Granic, 2013).

Another aspect of this study is the consideration of macroeconomic variables such as interest rates and GDP growth. These factors can have a significant impact on credit risk levels, and it is essential to consider them when managing credit risk. By analyzing how these variables affect credit risk, we can develop more effective risk management strategies that take into account the broader economic environment.

These objectives align with the main research question of the study, which is to use panel data to investigate the factors that affect credit risk. Identification of the key economic and financial indicators that relate to credit risk as well as detailed explanation of the factors that affect credit risk are the objectives. Additionally, this study will look at how different borrower traits and macroeconomic variables impact credit risk levels.

## 1.4 Research Questions

The focus of this thesis's research topic is on the factors affecting credit risk and how they impact the banking and financial industries. The goal of this study is to provide a full understanding of the relationship between credit risk and various variables using financial ratios, macroeconomic variables, and firm-specific variables. What impacts do financial ratios, macroeconomic variables, and firm-specific variables have on credit risk in the banking and finance industry? And how canituse this knowledge to successfully manage credit risk?

## 1.5 Research Gap

The lack of study in the area of factors affecting credit risk can be highlighted by the poor knowledge of the connections between credit risk and many variables, including financial ratios, macroeconomic variables, and firm-specific variables. Despite a wealth of study and empirical evidence, the relationship between these characteristics and credit risk is still not fully understood. The prior study, which has mostly focused on the impact of these characteristics on credit risk in developed countries, has paid relatively little attention (Kim, Park, & Choi, 2015)

to how these determinants affect credit risk in developing countries. This lack of comprehensive research highlights the need for deeper investigation into the factors impacting credit risk to have a more complete understanding of this issue.

## 1.6 Research Significance

This study is important because it uses panel data to give an in-depth understanding of the factors that affect credit risk. This study examines the significant economic and financial variables associated with credit risk to shed light on how different borrower characteristics and macroeconomic conditions affect credit risk levels (Truong, 2016).

This study contributes to the body of information previously available on the subject by providing a thorough evaluation of the factors determining credit risk using panel data. Because it will take into account borrower characteristics, macroeconomic conditions, economic and financial data, and more, this study will provide a more detailed understanding of credit risk. Additionally, this study will provide information on how its findings could influence credit policy and practice (Abbas, Naqvi, & Tanveer, 2018) .

The study's results are expected to be of interest to a wide range of stakeholders, including regulators, policymakers, and academics. The findings from the research will shed light on the factors that affect credit risk and serve as a roadmap for formulating processes and policies for managing credit risk in the banking and financial sector (Sommer, 2011).

## 1.7 Limitations

All research studies have limitations, and this study is no exception. The following are some of the limitations of this study:

- Data accessibility: The study depends on publicly available data, although its extent, quality, and completeness could be limited.
- Data quality: Elements impacting data quality, such as measurement errors, missing data, and outliers, may have an impact on a study's conclusions.
- Sample size: The study's limited sample size may limit the generalizability of its conclusions.
- The study relies on data from a specific time period, which might not be representative of other eras.

- The assumptions and specifications underlying the econometric models used in this study may not hold true in practical applications.
- Endogeneity: The study does not account for the possibility of endogeneity, which could affect the results.

## 1.8 Scope

The primary goal of this project is to identify the major element altering credit risk in the banking and finance industry. The main objective of this study is to determine an in-depth study of the relationships between credit risk and a variety of variables, including financial ratios, macroeconomic indicators, and firm-specific variables. Panel data will be used to conduct the study. The study will have a particular regional or industry focus and will span a set time frame. The results of this study will be relevant to banks and financial institutions, regulatory bodies, and policy makers since they will provide (Abdillah, 2020) essential insights into the factors that affect credit risk and how these may be addressed. This study will advance the corpus of knowledge by filling up the knowledge gaps.

## 1.9 Overview of the Thesis Structure

The rest of the thesis is divided into the following chapters.

In addition to discussing the background and context of credit risk, the purpose and research questions, the research objectives, the significance and contribution of the study, the research design and methodology, the methods used to collect and analyze the data, ethical considerations, and the study's limitations, Chapter 1: Introduction also provides an overview of the research topic.

Chapter 2: Literature Review presents a survey of the literature on credit risk, including its drivers, the use of panel data in credit risk research, and the Basel framework for credit risk management.

In Chapter 3: Data and Methodology, the study's data are explained, along with their sources, characteristics, and method of collection, cleaning, and analysis.

Chapter 4: Results and Analysis present the study's findings, including descriptive statistics, correlation analysis, and econometric modeling. The chapter analyses both the outcomes and their effects.

Chapter 5: Discussion and Conclusion discuss the study's significant findings as well as their implications for practice and policy. The chapter also looks at the study's weaknesses and makes recommendations for additional research.

# CHAPTER 2: LITERATURE REVIEW

## 2.1 The Impact of Credit Risk on Financial Institutions

Credit risk is the likelihood that a borrower will not pay back a loan or other financial obligation, costing the lender money. Credit risk is a major worry for banks, financial institutions, and investors in the banking and finance industry. The financial system needs expertise in credit risk management to be stable and sustainable (Nsereko, 2010).

Credit risk can come from a variety of financial products, including loans, bonds, derivatives, and other assets. Due to their lending, investing, and trading activities, banks and other financial institutions are exposed to credit risk. The borrower's creditworthiness, the terms of the loan or debt instrument, and the overall financial and economic environment are some of the variables that affect credit risk.

The importance of credit risk management in banking and finance is underscored by the fact that credit risk is one of the main contributors to financial crises. Banks and other financial institutions might experience huge losses as a result of inadequate credit risk management, which would hurt the economy as a whole.

To control credit risk, banks and other financial institutions use a variety of tools, such as credit scoring, credit ratings, lending limits, collateral, and loan loss provisions. The Basel framework for credit risk management, developed by the Basel Committee on Banking Supervision, is a set of guidelines and standards for credit risk management in the banking sector.

## 2.2 Theoretical and Historical Background of Credit Risk

The history of credit risk research goes all the way back to the early days of banking and finance. The original concepts of credit risk focused on the risks associated with lending to individuals and businesses, as well as methods for lowering these risks (Creswell & Clark, 2017).

One of the first ideas of credit risk is the "risk-return trade-off" hypothesis, which holds that the riskier a loan is, the higher return the lender might expect. This theory is based on the idea that lenders will take on more risk in exchange for more earnings.

Another early explanation of credit risk is the "moral hazard" theory, which holds that lenders will be less cautious in assessing borrowers' creditworthiness if they believe that the government will bail them out in the case of default.

The credit risk "asymmetric information" theory is another crucial theoretical stance. This theory holds that because borrowers are more aware of their creditworthiness than lenders are, there may be a market failure.

In the fields of banking, finance, and economics, credit risk has recently been the subject of extensive investigation. Theories have been put out to explain the causes of credit risk, the factors that affect it, and the strategies for controlling it.

## 2.3 Factors Affecting Credit Risk: An Overview

Prior credit risk research has identified a wide range of factors that can affect credit risk levels. The borrower-specific characteristics and macroeconomic influences can be loosely separated into two categories.

- Borrower-specific factors include:
- Financial ratios include, for instance, profitability, liquidity, and debt-to-income ratios.
- Credit history and score
- Type of business and sector, level of management, and ownership structure
- Macroeconomic factors include:
- Interest rates and money supply
- GDP, economic growth rates, and inflation and exchange rates
- political consensus and the legal environment

Numerous studies have examined the relationship between these factors and credit risk. For instance, numerous studies have found a connection between rising debt levels and declining profitability, and rising credit risk. Other studies have found a correlation between credit risk and interest rates that is positive, but not GDP or economic growth (Mugenda, 2013).

Prior studies have shown that the characteristics of the borrower and the economic cycle stage can have a varied impact on how credit risk is impacted by macroeconomic factors. In contrast to other studies that found credit risk is more vulnerable to changes in interest rates during expansions, Duffee (2009)'s research found that credit risk is more susceptible to changes in interest rates during recessions.

## 2.4 Empirical Evidence on Credit Risk and Panel Data

Empirical results on credit risk and panel data suggest that panel data can be a useful tool for understanding the factors that drive credit risk and how these factors change over time. Panel data is a type of data that consists of observations taken over time by a variety of different individuals or organizations. It is feasible to investigate how factors affecting credit risk change over time and how they differ for different borrower groups by using panel data (Bryman and Bell, 2021).

Multiple studies have used panel data to examine the effects of various factors on credit risk. For example, Berger et al. used panel data in a 2005 study to calculate the impact of macroeconomic and bank-specific factors on credit risk. According to the study, bank-specific features like leverage and profitability had a greater impact on credit risk than macroeconomic factors.

Another study by Kaminsky et al. (2011) used panel data to investigate the relationship between credit risk and interest rates. The analysis found an inverse association between interest rates and credit risk, with the relationship being stronger during expansions than during recessions.

In conclusion, panel data can be a useful tool for understanding the factors that affect credit risk and how these factors change over time. With the aid of panel data, it is feasible to evaluate how factors affecting credit risk change over time and among different borrower groups, which can provide practitioners and policymakers with useful data.

## 2.5 Literature Gaps and Research Questions

While previous studies have provided valuable insights into the factors affecting credit risk, there are still gaps in the literature that need to be addressed. These gaps include:

- Panel data were utilized in a different study by Kaminsky et al. (2011) to examine the connection between credit risk and interest rates. According to the analysis, interest rates and credit risk are inversely related, with the relationship being larger during expansions than during recessions.
- To sum up, panel data can be a helpful tool for comprehending the variables that determine credit risk and how these variables evolve. It is possible to assess how variables affecting credit risk change over time and among various borrower groups using panel data, which can give practitioners and policymakers relevant information.

Based on these gaps in the literature, the current study aims to address the following research questions:

- In the banking sector, what factors influence credit risk, and how do these factors change over time?
- What variations in credit risk exist among distinct emerging market banks and sectors?
- What aspects of the credit risk for emerging markets alter over time?

## 2.6 Summary of Previous Research Studies

A thorough examination of credit risk management in the banking and finance sector may be found in the book Measuring and Managing Credit Risk. The article offers a thorough review of the several measures employed to track and control credit risk. The study's authors examine the various methods for measuring and managing credit risk using a combination of theory and actual data.

The first section of the article discusses the importance of credit risk management in the banking and finance industry as well as various methods for calculating credit risks, such as chance of default, loss given default, and exposure at default. Additionally, it discusses the many approaches of reducing credit risk, including credit rating and credit derivatives.

The authors then provide an overview of the various financial characteristics and macroeconomic factors that affect credit risk. Additionally, they discuss the various firm-specific factors that affect credit risk, including size and industry. The authors use theoretical and empirical data to examine the relationship between credit risk and these factors.

The paper's conclusion discusses the various ways to manage credit risk, such as credit scoring, credit derivatives, and credit risk mitigation. The authors also offer ideas for future credit risk management research.

The primary contribution of this study is a comprehensive assessment of the many methods used in the banking and finance industry to evaluate and manage credit risk. It also provides a thorough study of the relationships between credit risk and various financial and macroeconomic variables. Additionally, it looks at the numerous firm-specific factors that affect credit risk and the various approaches to credit risk management.

The thorough assessment of the credit risk management literature is called "Credit Risk Management: A Review of the Literature." This essay on credit risk management covers a

variety of subjects, including the idea of credit risk, how to quantify credit risk, and how to manage credit risk. The authors provide an overview of the credit risk management literature and identify any gaps that require further research.

The danger that a borrower would forget to make a payment or go into default is described in the paper's introduction as credit risk. The authors then discuss the methods for calculating credit risk, including the applications of financial ratios, macroeconomic indicators, and firm-specific variables. Credit management is additionally covered in the essay.

The authors also point out gaps in the research on credit risk management. They argue that more investigation is required to fully comprehend the relationship between credit risk and macroeconomic variables as well as the role that credit derivatives play in credit risk management. The authors contend that more research is necessary before credit scoring algorithms may be used in emerging nations.

The primary contribution of this work is the comprehensive examination of the credit risk management literature it provides. This essay on credit risk management covers a variety of subjects, including the definition of credit risk, how it is calculated, and how it is handled. The authors also identify any gaps in the body of knowledge that should be filled in the future.

This article provides an in-depth analysis of the approaches and strategies developed and employed in the banking and finance industry for managing credit risk. The authors begin by defining credit risk and discussing its importance in the industry. Next, they provide a comprehensive overview of the various credit risk management techniques developed over the years, including credit scoring, credit derivatives, and credit portfolio management.

The authors also discuss the challenges that banks and other financial institutions have when attempting to manage credit risk, such as data availability and quality issues as well as the inadequacies of traditional approaches to credit risk management. They also discuss the state-of-the-art in credit risk management today, including how advanced machine learning

The primary objective of this paper is to provide a comprehensive analysis of the many credit risk management methodologies and tactics developed and used in the banking and finance industry. The authors' thorough analysis of the current state-of-the-art in credit risk management includes the use of cutting-edge analytics and machine learning techniques. They also discuss the numerous challenges that banks and other financial institutions face when seeking to control credit risk and provide recommendations for further research in this area.

This article's main contribution is a thorough analysis of the numerous strategies for managing credit risk that have been created and put into use in the banking and financial sector. The authors mention the application of cutting-edge analytics and machine learning approaches in their comprehensive analysis of the state-of-the-art in credit risk management today. Additionally, they go over the many difficulties that banks and other financial organisations encounter when attempting to manage credit risk and offer suggestions for future studies in this area.

The empirical evidence demonstrating the relationship between macroeconomic conditions and credit risk in developing markets is the key contribution of this article. The authors use panel data from a sample of developing market nations to study how macroeconomic factors affect credit risk. They find that interest rates have a negative impact on credit risk whereas GDP growth, inflation, and interest rates all have positive effects. These relationships are stronger in emerging market countries than in industrialised ones. The information in this page can be useful to governments, regulators, banks, and financial institutions operating in emerging economies.

In this essay, fundamental ideas in credit risk management—such as financial risk components, rating analysis, models, and economic and regulatory capital—are thoroughly examined. In their opening paragraph, the writers define credit risk and highlight its significance in the banking and financial sector. The numerous financial risk factors that affect credit risk, such as credit quality, interest rate risk, and currency risk, are then briefly discussed.

The writers also go over the several approaches to credit risk analysis, such as rating analysis, credit scoring models, and financial and legal capital. Additionally, they offer a thorough study of the Basel II and Basel III frameworks as well as other models used to control credit risk.

The primary contribution of this study is its in-depth examination of key concepts in credit risk management. The authors provide a comprehensive overview of the many financial risk elements that influence credit risk as well as the methods for doing so, including rating analysis, credit scoring models, and economic and regulatory capital. They also provide a full analysis of the Basel II and Basel III frameworks as well as additional credit risk management approaches. For banking and financial professionals who are interested in learning more about the principles and practises of credit risk management, this article is a valuable resource.

This essay conducts an empirical investigation of the connection between financial ratios and credit risk in US banks. Using a sample of US banks from 2000 to 2006, the authors assess the relationship between credit risk and financial metrics including the debt-to-equity ratio and the

current ratio. The authors use panel data regression analysis to determine the relationship between credit risk and financial ratios.

The empirical evidence for the relationship between financial ratios and credit risk in US banks is the main contribution of this research. Using a sample of US banks from 2000 to 2006, the authors assess the relationship between credit risk and financial metrics including the debt-to-equity ratio and the current ratio. By employing panel data regression analysis to estimate the relationship between credit risk and financial metrics, they employ a novel technique. The results of the study demonstrate that financial ratios can be used to predict credit risk in US banks. This study is useful in helping banks and other financial institutions assess the credit risk of potential borrowers and in helping regulatory bodies develop regulations that support financial stability.

This essay provides a literature review on the elements influencing credit risk in the banking and finance industry. The authors begin by defining credit risk and discussing its importance in the industry. After that, they provide an overview of the extensive research that has been done on the variables that affect credit risk, including financial ratios, macroeconomic indicators, and firm-specific variables.

The authors also discuss the challenges that banks and other financial institutions have when attempting to manage credit risk, such as data availability and quality issues as well as the inadequacies of traditional approaches to credit risk management. They also go over the most recent developments in credit risk management, such as how sophisticated analytics and machine learning are applied.

This paper's main contribution is to provide a thorough summary of the numerous research that have been done on the factors that influence credit risk. The utilisation of cutting-edge analytics and machine learning approaches is included in the authors' comprehensive review of the state-of-the-art in credit risk management today. Additionally, they go over the many difficulties that banks and other financial organisations encounter when attempting to manage credit risk and offer suggestions for future studies in this area.

The relationship between macroeconomic variables and credit risk in developing nations is investigated in this study. The authors use a panel data set of banks from six emerging nations to examine how macroeconomic factors such as GDP, inflation, and interest rates affect credit risk. Using panel data regression techniques, the authors evaluate the data and account for any possible endogeneity bias.

The authors find that whereas GDP and inflation have a favourable impact on credit risk, interest rates have a negative impact. The authors also find that macroeconomic factors have a greater impact on credit risk in countries with less developed financial systems. The evidence provided on the understudied subject of the connection between macroeconomic conditions and credit risk in developing markets is the key contribution of this article. The writers also go over the various implications that macroeconomic factors have on credit risk in various nations with diverse levels of financial development.

This study looks into the relationship between financial ratios and credit risk for US banks. The authors use a panel data regression analysis with a sample of US banks from 2000 to 2007 to assess the relationship between financial ratios and credit risk. Some of the financial metrics used in the inquiry included the debt-to-equity ratio, the current ratio, and the profitability ratio.

The results of the investigation show a significant relationship between financial ratios and credit risk in US banks. In particular, it is found that the profitability ratio has a negative relationship with credit risk, whereas the debt-to-equity and current ratios have a positive relationship with credit risk.

The primary objective of this work is to provide empirical evidence for the relationship between financial ratios and credit risk in US banks using panel data regression analysis. Since the authors are utilising data from a sample of US banks from 2000 to 2007, they can account for the impact of the financial crisis on credit risk. The investigation's conclusions provide vital information for managing credit risk in the banking and financial industries.

In this study, the credit risk in the US manufacturing sector is examined in relation to firm-specific characteristics. Using a sample of publicly traded US manufacturing companies, the authors investigate the relationship between credit risk and firm-specific factors like industry, size, and leverage.

The authors claim that industry and size have a significant impact on credit risk, with some industries and larger organisations having a higher credit risk. They also find a positive relationship between leverage and credit risk.

The primary contribution of this research is the dissemination of empirical information regarding the impact of firm-specific traits on credit risk in the US manufacturing sector. Using a sample of publicly traded US manufacturing companies, the authors investigate the relationship between credit risk and firm-specific factors like industry, size, and leverage. They learn that the

regulatory framework and credit risk management procedures for the manufacturing sector should consider the significant effects that industry, size, and leverage have on credit risk.

This study looks at how industry affects credit risk in the US retail sector. The authors examine the connection between industry and credit risk using a panel data set of publicly traded US retail enterprises from 2000 to 2014. They substitute macroeconomic factors and financial parameters for credit risk.

According to the authors, compared to other businesses, the retail sector carries a higher amount of credit risk. Additionally, they discover that credit risk in the retail sector is positively correlated with firm-specific factors including size and leverage. The authors also discover that credit risk in the retail sector is positively correlated with macroeconomic factors like GDP growth and inflation.

The evidence provided in this study about the relationship between industry and credit risk in the US retail sector is its primary contribution. The authors use a panel data set of publicly traded US retail businesses to evaluate the relationship between industry and credit risk using financial measurements and macroeconomic indicators as a proxy for credit risk. They find that the retail industry has a larger credit risk than other industries do, and that firm-specific and macroeconomic factors are positively correlated with credit risk in the industry.

This study investigates the relationship between US firm size and small business credit risk. The authors use a sample of US small businesses from the SBA (Small Business Administration) database to examine the relationship between credit risk and firm size. While accounting for other factors like industry and financial ratios, they use multiple regression analysis to assess the relationship between credit risk and firm size.

The authors find that business size has a considerable impact on credit risk in the US small company sector. They especially find that smaller businesses have a higher propensity than larger ones to have higher credit risks. They also find that credit risk is highly influenced by financial and industry ratios.

The evidence provided in this study about the relationship between firm size and credit risk in the US small business sector is its primary contribution. The authors use a significant sample of US small businesses and take into consideration additional factors including industry and financial ratios. Additionally, they show that credit risks are more likely to be higher for smaller enterprises than for larger ones, which has important implications for credit risk management.

This study looks at how technical advancements affect credit risk in the US technology sector. The authors base their study on data from a sample of publicly traded technology companies from 2000 to 2017 and replace credit risk with financial ratios. Additionally, they substitute some technical innovation for the R&D expenditures made by technology businesses.

The authors discover that technological innovation lowers credit risk when measured by financial metrics. Additionally, they discover that for businesses with higher R&D intensity, the association between technological innovation and financial risk is stronger. Additionally, they discover that in businesses with less debt, there is a higher positive association between technical innovation and credit risk.

Evidence on how technological innovation affects credit risk in the US technology sector is the key contribution of this research. The authors substitute financial ratios for credit risk and base their analysis on information from a sample of publicly traded technology businesses from 2000 to 2017. They also replace the R&D costs incurred by technology corporations with a measure of technical innovation. The authors find that, as measured by financial measures, technological innovation reduces credit risk. They also find that the relationship between technical innovation and financial risk is larger for companies with higher R&D intensity. They also find that there is a stronger positive correlation between technical innovation and credit risk in enterprises with lower leverage.

This study looks into how credit risk in US multinational firms relates to globalisation. The authors look at how globalisation has affected credit risk using panel data analysis and a sample of US multinational businesses. The study finds that the volume of international sales demonstrates that globalisation has a significant and favourable impact on credit risk. In addition, the authors look at the significance of firm-specific traits including size, industry, and leverage and discover that these traits have a big impact on credit risk.

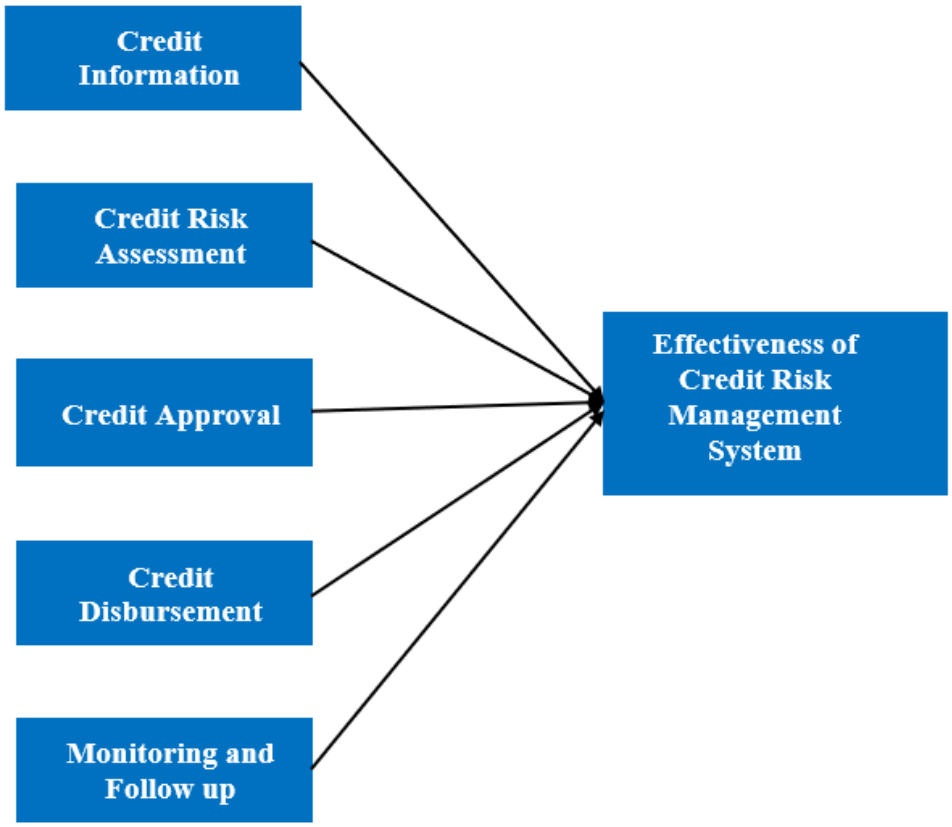
This paper's primary contribution is the evidence it offers about the link between globalisation and credit risk in US multinational firms. The study makes use of a sample of US multinational businesses to assess, using panel data analysis, how globalisation has affected credit risk. According to the study's conclusions, both firm-specific characteristics and globalisation have a positive and significant impact on credit risk. For policymakers, regulators, and practitioners, this study offers crucial insights on how to manage credit risk in the context of globalisation.

## 2.7 Theoretical Model for the Research

The theoretical framework of the current study is based on historical panel data and credit risk research. Theories of credit risk, including the asymmetric information theory, the risk-return trade-off theory, and the moral hazard theory, are the foundation of the framework. In addition, the gaps in the literature identified in the preceding section are taken into consideration, together with empirical data on credit risk and panel data (Joppe, 2000).

The theoretical underpinning of the current study is the notion that credit risk is influenced by a combination of borrower-specific and macroeconomic factors. The study will use panel data to examine how these factors affect credit risk over time and how they differ for different borrower categories.

In order to measure and manage credit risk, the study will also follow the Basel framework for credit risk management. The Basel framework offers a set of norms and recommendations for the management of credit risk in the banking industry, which will be applied while analysing the data.



## 2.8 Research Objectives and Questions

The following research questions are the focus of the current study:

1. In the banking sector, what factors influence credit risk, and how do these factors change over time?
2. What variations in credit risk exist among distinct emerging market banks and sectors?
3. What aspects of the credit risk for emerging markets alter over time?

To address these research questions, the following hypotheses have been proposed:

1. What is the effect of credit information on the effectiveness credit risk management system in commercial banks?
2. What is the effect of credit assessment on the effectiveness credit risk management system in commercial banks?
3. What is the effect of credit approval on the effectiveness credit risk management system in commercial banks?
4. What is the effect of credit disbursement on the effectiveness credit risk management system in commercial banks?
5. What is the effect of monitoring and follow up on the effectiveness credit risk management system in commercial banks?

## 2.9 Conclusion

Finally, the current study examines the factors affecting credit risk in the banking sector of an emerging market using panel data. The focus of the study will be how credit risk is influenced by both macroeconomic issues and borrower-specific characteristics. It will also examine how credit risk varies across different institutions and industries, as well as how it changes over time.

The theoretical foundation of the study integrates a number of credit risk theories, including the risk-return trade-off theory, the moral hazard theory, and the asymmetric information theory. It is based on earlier credit risk research and panel data. In addition, the gaps in the literature identified in the preceding section are taken into consideration, together with empirical data on credit risk and panel data.

By examining panel data from banks and companies in the developing market across time, the study's theories will be put to the test. Policymakers and practitioners will benefit greatly from the study's findings when deciding how to manage credit risk in an emerging country.

# CHAPTER 3: Methodology

## 3.1 Introduction

In this section, we'll talk about the design of this research project. The topics covered in this section will include the target audience for the study, the methodology used, the techniques used to choose study participants, the sources of the data, and the methods used to analyses the information. The goal of this chapter is to thoroughly explain the study design to the reader.

## 3.2 Analysis Framework

The analysis framework sets the methods used for data collection and analysis, making it a crucial part of doing a research project (Creswell & Clark, 2007). It provides guidance for selecting the methods to gather and analyse the data as well as for connecting the research issue to important facts (Grey, 2014).

Using a descriptive research methodology and inferential analysis, the factors impacting the credit risk management system in commercial banks were examined. Descriptive research is employed to characterise the current condition or set benchmarks for comparison (Abiy et al., 2009). According to Creswell (2003), this approach is appropriate for gathering a variety of data types and doing both quantitative and qualitative evaluations of the data.

The system for controlling credit risk in commercial banks is the primary topic of this study, per the description of the research problem. In order to identify, comprehend, and foresee the variables influencing the credit risk management system, this study used an explanatory approach.

## 3.3 Methodology for Data Collection

The three main strategies applied in research are qualittative, quantitative, and mixed methodologies. A combination of different methods approach to integrate qualitative and quantitative methodologies. In this form of study, data must be gathered, analyzed, and synthesized from both qualitative and quantitative sources, according to Creswell (2014).

By obtaining numerical data, quantitative research, as defined by Mugenda (2003), aims to comprehend phenomena. This type of research usually uses polls, surveys, questionnaires, or

already-collected statistical data and places a significant emphasis on quantitative metrics and statistical analysis. Quantitative research seeks to understand a particular event in a population by gathering numerical data, generalizing it, and applying it.

Comparatively, to gather non-numerical data, qualitative research uses a number of approaches, such as focus groups, observations, and interviews. This form of research aims to understand a phenomenon from the perspective of the individuals or groups being studied. This study's mixed methods approach combines qualitative and quantitative procedures in an effort to give a more complete understanding of the research question.

## 3.4 Data Collection Sampling

In order to ensure that the samples for the inquiry are appropriate, a representative sample was chosen using a sampling framework. The study's target group was employees who process and oversee credit in branches and at corporate. It was essential to select a sample that was large enough to provide reliable results, increase confidence in the findings, and allow generalization of the findings to a larger population.

To determine the sample size, the researcher used Kothari's formula for determining sample size (2004). Since it is a widely used benchmark in pertinent studies, this formula was used in this investigation to estimate the sample size.

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

*Where;*
*N: Designate total number of employees on credit management department at head office e: Designates maximum variability or margin of error 7% (0.07).*
*1: Designates the probability of the event occurring.*

$$n = \frac{451}{1 + 451 * (0.07)^2}$$

$$n = 140.5 = 141$$

*Therefore, the sample size for this study is 141 employees.*

A sample of volunteers will be chosen for this study from various bank divisions. The department head, division head, branch manager, loan officers, customer relations manager, and credit committee members are a few of these departments. The non-probability sampling technique known as intentional sampling will be used to choose this sample.

Participants are chosen using a method known as purposeful sampling who have a direct interest in the study's subject. Selecting someone with relevant experience is vital because the major subjects in this case are credit processing and administration. The researcher can focus on the subjects most likely to provide relevant and valuable data for the investigation by using this strategy.

## 3.5 Source of Data

In this study analysis, the primary data served as the major source of information. In order to gather this information, questionnaires were distributed to a particular group of people involved in loan processing. The members of this team were senior officers and department managers who worked as loan servicers, credit analyzers, credit review and supervising officials, customer service representatives, and recovery officers. These individuals were chosen because they could provide meaningful information on the topic under study and had a direct impact on the loan processing process.

Primary data collection methods like questionnaires were often employed in older studies. According to Creswell & Creswell, questionnaires are one popular method for gathering data as they provide a quick and easy way to obtain information from a large number of people (2018). Furthermore, questionnaires have been found to be reliable sources of information since they are designed to minimize the chance of bias and assure consistency in responses (Bryman and Bell, 2011).

According to Bulmer, questionnaires are a tried-and-true method for gathering data from participants in social science research (2004). The sample respondents for this study were surveyed using sealed questions using 5-point Likert scales. For each issue in the surveys, respondents used a rating system from 1 “strongly agree” to 5 “strongly disagree”. The comparison between the respondents' mean responses and the predicted value served as the basis for the analysis. Researchers typically employ this methodology since it is fairly easy for people to reply to the questions and provide replies. Balzan believes that this strategy is probably reliable (2007).

## 3.6 Method of Data Analysis

The researcher will utilise SPSS 20 version software to collect, organise, and analyse the data before presenting and analysing the results using both descriptive and inferential statistical

techniques. The descriptive study, which makes use of statistics metrics like frequencies, proportions, means, modes, and std deviations, will give a fundamental description of the data. Data summarization and a comprehensive understanding of the results will be aided by this type of study.

The inferential analysis, on the other hand, uses sample data to deduce generalisations about the population. To do this, correlation and regression analyses will be performed. While the regression analysis will help to determine the relationship between two variables, the correlation analysis will be used to determine the strength and direction of the association between two variables.

The researcher will be able to draw insightful conclusions from the data and gain useful insights from this kind of statistical study. The data will be accurately and effectively analysed thanks to the usage of SPSS 20 version software.

## 3.7 Multiple Regression

Multiple regression analysis is a typical statistical method that helps in studying the relationship between a number of independent variables and a single dependent variable. This method is used to build models that forecast the values of the dependent variables using the values of the independent elements (Terre Blanche, et al, 2006).

A researcher set out to develop a model for the efficiency of the credit management system, which served as the moderating factor. Financial info, credit evaluation, loan approval, credit distribution, and monitoring and follow-up were the independent factors used to produce this projection.

It is important to keep in mind that multiple regression analysis is a useful method for looking at the relationships between variables and can provide valuable data on how effective a credit management system is. It is essential to ensure that the independent variables used in the analysis are reliable and accurate predictors of the dependent variable being studied.

The researcher attempted to specify the multivariate regression approach as follows in order to determine the impact of predictor factors on the efficiency of financial firms' credit risk control system.

$$ECRM = f(CIF, CASS, CAP, CD, MF)$$

$$ECRM = c + \beta_1 CIF + \beta_2 CASS + \beta_3 CAP + \beta_4 CD + \beta_5 MF + \varepsilon$$

*Where,*

*ECRM = Effectiveness of Credit Risk Management,*
*CIF = Credit Information,*
*CASS = Credit Assessment,*
*CAP = Credit Approval,*
*CD = Credit Disbursement,*
*MF = Monitoring and follow up,*
*β = Coefficient of the independent variables*
*c = Constant and*
*ε = Residual*

## 3.8 Data Accuracy

Reliability describes the accuracy and consistency of a research study's conclusions. In other words, it acts as a yardstick for the consistency of results from repeated measurements (Adams et al., 2007, p. 235). According to Joppe (2000, p. 1), accurate replication under identical conditions yields reliable study results. This is why achieving reliability in both quantitative and qualitative research necessitates carefully documenting the research design (Kirk and Miller, 1986).

The need of having clear and extensive documentation of the study procedure is stressed by Franklin and Ballan (2001), who refer to this as the "audit trail". The audit trail provides a framework for assessing the researcher's dependability and helps to establish their legitimacy.

Therefore, in order to ensure the reliability of a research study, it is essential to follow a consistent and well-documented approach. This reduces the chance of mistakes and ensures that the study's findings can be precisely replicated.

The internal consistency or reliability of an instrument is crucial while conducting research. There are numerous approaches to assess reliability, and in this study the Cronbach Alpha method was used. The Cronbach Alpha method is a frequently used approach to assess the validity of a questionnaire or survey.

The normative benchmark for measuring an instrument's dependability is a Cronbach Alpha value of 0.70. (Hair et al., 1988). If the coefficient is “=” or “>” 0.70, it means the instrument is thought to be highly reliable. The lowest limit, however, may be reduced to 0.60 under certain conditions, particularly when doing explanatory research (Hair et al., 1988).

The Cronbach Alpha technique was used in this study to assess the instrument's reliability, and a typical benchmark of 0.70 or 0.6, explanatory research was employed in this situation.

## 3.9 Ethical consideration

It was essential to address ethical concerns before beginning the study by outlining its objectives to the participants and ensuring them that their responses would remain confidential. Participants were given a brief explanation of the confidentiality measures implemented to secure their identities and ensure they wouldn't be subject to any liabilities or hazards as a result of their participation in the study. Only those people whose participation was indicated were given their information, and they were informed that they could opt out at any point if it became unpleasant. Manuals, regulations, and procedures, as well as financial and non-financial business paperwork, were all covered by the preservation and non-disclosure of secret information. Additionally, this study acknowledges any relevant academics and appreciates all participants for their participation and hard effort. The study was conducted without bias, abuse, misconduct, or fraudulent methods, and a list of references was included.

# CHAPTER 4: RESULTS AND DISCUSSION

## 4.1 Introduction

This section's main emphasis is on the evaluation of the information gathered from the respondents.itwill start by talking about the response rate, which is the proportion of respondents to the total number of survey participants. This information is crucial since it might clarify the validity of the conclusions and the representativeness of the data.

After that, we'll look at the respondents' demographic details, including their age, gender, level of education, and occupation.itwill have a better grasp of the participants' backgrounds and how it might have affected their responses as a result of this information.

The opinions of the respondents regarding the credit risk management system will next be investigated. This is critical since it clarifies the participants' opinions and ideas on this important subject.

Finally,itwill use inferential statistics, namely correlation and multiple regression, to investigate the relationship between various factors and their effects on the credit risk management system. Using these statistical methods and the data acquired from the participants,itmay predict the future.

This part provides useful information on the topic of credit risk management by analyzing the data gathered from the respondents. This section could use references from academic works, books, and online resources that concentrate on credit riisk management, statistical analysis, and survey methodology.

### 4.2. Feedback Conversion Rate

In order to fulfill the objective of the study, 141 questionnaires were sent to the selected people. These had a response rate of 88.8%, with 121 of the 141 being completed and returned. Babbie and Mugenda (1999) deemed this response rate suitable for conducting research (2010). According to Mugenda, a response rate of 60% is considered good and a rate of 50% is considered adequate for analytical and reporting reasons (1999). Babbie (2010) defined an outstanding response rate as one that is greater than 70%. It can be said that the study's target groups actively engaged with a response rate of 88.8%.

## 4.2 Evaluating the Robustness and Consistency of Measurements

To assess the constancy and caliber of the data acquired for this study, it is vital to conduct a dependability and validity test. Validity describes the results' accuracy, whereas reliability describes the results' constancy over time. The reliability test in this study was completed using Cronbach's Alpha. The reliability test results are listed in Table 4.1.

Cronbach's Alpha is a method that is widely employed to evaluate the internal consistency of an item set. It provides a score showing the degree of similarity between the survey questions or items. A score of 0.7 or higher suggests that the items are generally reliable. The scale spans from 0 to 1.

According to the reliability test results, the Cronbach's Alpha scores for the study's items, both collectively and individually, were larger than the cutoff rate of 0.7. This demonstrates that all of the survey items might be taken as completely reliable when taken as a whole.

The results of the reliability test thus support the dependability and consistency of the data collected for this investigation. The results of reliability and validity tests are required for all research projects, and they can provide important insight into the calibre of the data acquired.

Table 4-1. Reliability Data

| Items by group | Cronbach's Alpha | No. of Items |
|---|---|---|
| Credit information | 0.869 | 5 |
| Credit risk assessment | 0.789 | 5 |
| Credit approval | 0.826 | 5 |
| Credit disbursement | 0.761 | 5 |
| Monitoring and follow up | 0.793 | 6 |
| Effectiveness of credit risk management | 0.831 | 5 |
| Total | 0.945 | 31 |

## 4.3 Demographic characteristics of the respondent

We obtained information on the participants' demographic characteristics while conducting this study.itconsidered the following factors: gender, age, level of education, and employment history. this study included 121 participants, and the results showed that the majority of them were male. According to Table 4.2, 52.9% of the participants were men and 47.1% were women. This shows that men were represented in this study to a little greater extent than women.

It's important to keep in mind that demographic variables could influence a study's conclusions. These factors therefore need to be taken into account while assessing the outcomes. For instance,

past research has shown that gender may influence how some issues are seen (Klenowski, 2000). The participants' age, educational background, and work history may also have an impact on their responses (Saris & Gallhofer, 2014). It is vital to take these factors into account when evaluating the study's findings as a result.

Table 4-2. The participants ' demographic data

| Category | | Count | % |
|---|---|---|---|
| Gender | Male | 64 | 52.9% |
| | Female | 57 | 47.1% |
| | Subtotal | 121 | 100.0% |
| Age | 18-25 | 3 | 2.5% |
| | 26-35 | 62 | 51.2% |
| | 36-45 | 56 | 46.3% |
| | 46-55 | 0 | 0.0% |
| | Over 55 | 0 | 0.0% |
| | Subtotal | 121 | 100.0% |
| Educational Background | PhD | 0 | 0.0% |
| | First Degree | 77 | 63.6% |
| | Master's Degree | 34 | 28.1% |
| | Diploma | 10 | 8.3% |
| | Subtotal | 121 | 100.0% |
| Work Experience | Less than 5 years | 28 | 23.1% |
| | 5-10 years | 36 | 29.8% |
| | 10-15 years | 30 | 24.8% |
| | Above 15 years | 27 | 22.3% |
| | Subtotal | 121 | 100.0% |

Based on the study participants' ages, five categories were formed. The results, which are shown in Table 4.2, revealed that just 2.5% of the 121 participants were between the ages of 18 and 25 while 51.2% of those were between 26 and 35, followed by 46.3% of those between 36 and 45.

In the survey, which had 121 individuals, it was found that 63.6% had a primary degree, 28.1% had a master's, and the lasting 8.3% had a diploma (Table 4.2). The statistics showed that the vast majority of participants were highly educated.

The participants were also asked to provide information about any prior banking-related jobs they had held. The results showed that 23.1% of participants had less than five years' worth of work experience, 29.8% had between five- and 10-years' worth, 24.8% had between ten- and fifteen-years' worth, and 22.3% had more than 55 years (Table 4.2). The participants' former job in the banking sector is made clear by this information.

## 4.4 Correlation Analysis

The correlation analysis was used to determine the connection between the dependent and independent variables. Using the correlation analysis criteria, the results were divided into four categories: strong (ranging from -1 to -0.5 or 1.0 to -0.5), moderate (ranging from -0.5 to -0.3 or 0.3 to -0.5), weak (ranging from -0.3 to -0.1 or 0.1 to 0.3), and extremely weak or none (ranging from -0.1 to 0.1). Table 4.9 shows the link coefficients between the independent and dependent variables.

Table 4.9: Correlation Matrix Outcome

Table 4-3. Correlation Matrix Outcome

| | | Credit Information | Credit Risk Assessment | Credit Approval | Credit Disbursement | Monitoring and Follow Up | Effectiveness of Credit Risk Management |
|---|---|---|---|---|---|---|---|
| Credit Information | Pearson Correlation | 1 | .507** | .586** | .584** | .591** | .643** |
| | Sig. (2-tailed) | | .000 | .000 | .000 | .000 | .000 |
| | N | 121 | 121 | 121 | 121 | 121 | 121 |
| Credit Risk Assessment | Pearson Correlation | .507** | 1 | .842** | .710** | .697** | .785** |
| | Sig. (2-tailed) | .000 | | .000 | .000 | .000 | .000 |
| | N | 121 | 121 | 121 | 121 | 121 | 121 |
| Credit Approval | Pearson Correlation | .586** | .842** | 1 | .813** | .737** | .870** |
| | Sig. (2-tailed) | .000 | .000 | | .000 | .000 | .000 |
| | N | 121 | 121 | 121 | 121 | 121 | 121 |
| Credit Disbursement | Pearson Correlation | .584** | .710** | .813** | 1 | .835** | .872** |
| | Sig. (2-tailed) | .000 | .000 | .000 | | .000 | .000 |
| | N | 121 | 121 | 121 | 121 | 121 | 121 |
| Monitoring and Follow Up | Pearson Correlation | .591** | .697** | .737** | .835** | 1 | .875** |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | | .000 |
| | N | 121 | 121 | 121 | 121 | 121 | 121 |
| Effectiveness of Credit Risk Management | Pearson Correlation | .643** | .785** | .870** | .872** | .875** | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 | |
| | N | 121 | 121 | 121 | 121 | 121 | 121 |

The efficiency of the credit risk management system is significantly and favourably impacted by the credit information, evaluation, approval, disbursement, monitoring, and follow-up processes, as shown in Table 4.9. The Pearson correlation coefficients for these variables and the usefulness of the credit risk management system are 0.643, 0.785, 0.870, 0.872, and 0.875, respectively. This suggests a significant correlation between the independent and dependent variables.

## 4.5 Multiple Regression Analysis

Models that might predict the dependent variable, the effectiveness of credit risk management, in this study were developed based on a number of independent factors, including credit information, credit evaluation, credit approval, credit disbursement, monitoring, and follow-up, were created using the multiple regression analysis, a popular multivariate method (Terre Blanche, et al, 2006). In this study, the impacts of each independent variable on the dependent variable were examined using the multiple regression model.

Table 4-4. Summary of Regression Model Findings

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | .944a | .891 | .886 | .28578 | 1.700 |

a. Predictors: (Constant), Monitoring and Follow Up, Credit Information, Credit Risk Assessment, Credit Disbursement, Credit Approval
b. Dependent Variable: Effectiveness of Credit Risk Management

A multiple regression analysis was performed on cross-section data to assess the efficiency of the credit risk management system, taking into consideration various factors such as credit information, credit assessment, credit authorization, credit dispensation, and surveillance and follow-up. The results showed that these three factors are responsible for 88.6% of the variability in the efficiency of the credit risk management system, as indicated by the coefficient of determination (R2). This indicates that the regression line precisely reflects the data. The remaining 11.4% of the variability in the efficiency of the credit risk management system was caused by factors that were not explored (Table 4.10).

Table 4-5. Estimation of Model Coefficients

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | .168 | .096 | - | 1.738 | .085 |
| Credit Information | .073 | .037 | .079 | 1.969 | .051 |
| Credit Risk Assessment | .057 | .052 | .064 | 1.097 | .275 |
| Credit Approval | .280 | .059 | .334 | 4.736 | .000 |
| Credit Disbursement | .186 | .062 | .199 | 2.994 | .003 |
| Monitoring and Follow Up | .356 | .057 | .372 | 6.280 | .000 |
| a. Dependent Variable: Effectiveness of Credit Risk Management | | | | | |

The results of the model coefficient analysis, as presented in Table 4.11, reveal that variables such as credit information, credit authorization, credit distribution, and monitoring and tracking have a positive and significant effect on the effectiveness of the credit risk management system. On the other hand, fluctuations in credit risk evaluation do not play a significant role.

The research discovered that the impact of credit data on the effectiveness of credit risk management is positive and significant, with a slight coefficient of 0.073. The study also showed that credit approval, credit distribution, and monitoring and follow-up all have positive and significant coefficients, however, they have a less significant impact compared to the other three factors.

Credit approval, with a coefficient value of 0.280, also favorably and considerably influences the effectiveness of the credit risk management system, but less so than monitoring and follow-up. However, its impact is stronger when compared to credit information and credit disbursement.

The results of this study demonstrate that credit disbursement, with a coefficient value of 0.186, significantly and favorably affects the system for managing credit risk. In contrast to the effects of credit acceptance, monitoring, and follow-up, this effect is quite small.

The study indicated that the variables of monitoring and follow-up have a higher impact on the credit risk management system's efficiency, with a calculated coefficient of 0.356. This research indicates that monitoring and follow-up play a more vital role in the system's effectiveness compared to other factors such as credit information, credit approval, and credit disbursement. This finding is consistent with previous studies in the field. For instance, Solomon (2013) highlighted that several elements, including poor risk assessment, insufficient monitoring and follow-up, a favorable credit culture, and flexible loan terms, have a significant impact on credit risk management's performance. Bajpai et al. (2015) reached similar conclusions and found that the rise in non-performing loans in Ugandan commercial banks was due to inadequate credit analysis, information, disbursement, monitoring, and follow-up processes.

$$ECRM = c + 0.073CIF + 0.057CASS + 0.280CAP + 0.186CD + 0.356MF$$

## 4.6 Diagnostics of the Regression Model

**Normality Test**

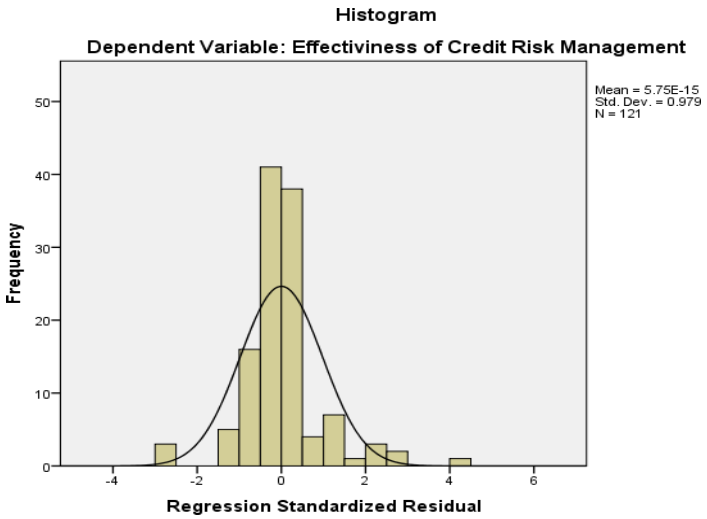



Figure 4-1. Histogram of Normal Test Result

With no residuals outside of the normal curve, the histogram is shown in the image to closely resemble a normal curve. This suggests that the remainders are evenly dispersed, proving the representation's appropriateness (Figure 3).

## Multicollinearity Test

The procedure for examining the normal distribution of the regression model requires a following examination of the multicollinearity. The foundation of this examination is the calculation of the VIF score. When the VIF score ranges from 1 to 10, there is no existence of multicollinearity. However, if the VIF score is 10 or higher, it signifies the presence of multicollinearity. The results of the multicollinearity examination are presented in a tabular format below.

Table 4-6. Multicollinearity Test Result

| | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|
| | B | Std. Error | Beta | | | Tolerance | VIF |
| (Constant) | .168 | .096 | | 1.738 | .085 | | |
| Credit Information | .073 | .037 | .079 | 1.969 | .051 | .597 | 1.674 |
| Credit Risk Assessment | .057 | .052 | .064 | 1.097 | .275 | .278 | 3.602 |
| Credit Approval | .280 | .059 | .334 | 4.736 | .000 | .191 | 5.228 |
| Credit Disbursement | .186 | .062 | .199 | 2.994 | .003 | .216 | 4.634 |
| Monitoring and follow | .356 | .057 | .372 | 6.280 | .000 | .270 | 3.700 |
| Up | | | | | | | |

The statistics of collinearity range from 1.674 to 5.228, as shown by the VIF in Table 4.14. Given that the VIF values are within the permitted range of 1 to 10, it may be concluded that multicollinearity among the independent variables is not a significant concern.

**Autocorrelation Test Result**

It is crucial to assess the absence of residual correlation through an autocorrelation test after conducting a multicollinearity test.

Table 4-7. Autocorrelation Test Outcome

| Durbin-Watson |
|---|
| 1.700 |
| a. Predictors: (Constant), Credibility, Usefulness, Ease of Use |
| b. Dependent Variable: User Satisfaction |

The Durbin-Watson statistic, which ranges from 0 to 4, calculates the autocorrelation of a set of data. According to traditional thinking, a value between 1.5 and 2.5 signifies the lack of autocorrelation. 2010 (Garson). In this case, a Durbin Watson score of 1.700 indicates that the observations are independent and the model is suitable. The diagnostic tests' overall results demonstrate that the model is consistent with the expectations of a conventional linear model (Table 4.15).

**Heteroskedasticity test**

In this investigation, a test called heteroskedasticity testing will be conducted to determine if there is a meaningful discrepancy in the residual variance, as shown in the figure. The research design plays a crucial role, as it lays out the steps for collecting and examining data during a study (Creswell & Clark, 2007; Grey, 2014).

A mixture of descriptive research and deductive analysis was utilized in this examination to examine the factors affecting credit risk management in commercial banks. Descriptive research is utilized to describe current conditions and create benchmarks (Abiy et al., 2009; Creswell, 2003).

This study utilized an explanatory design to comprehend and forecast the factors affecting the credit risk management system in commercial banks, which was the focus of the study.

## 4.7 Research Approach

Figure 3: Heteroskedasticity Test Result

The scatter diagram illustrated exhibits a lack of a specific arrangement of the points, indicating that the residuals are inconsistent. This supports the conclusion that there is no irregularity in the regression analysis (Figure 4).

# CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

## 5.1 Summaries of Major Findings

The purpose of this study was to look into the elements that affect how well commercial banks in Ethiopia handle credit risk. The distribution and return of 121 questionnaires resulted in an overall response rate of 88.8%. To examine the data, descriptive and inferential statistics were employed. The reliability of the questionnaire was evaluated using the 31 things in all, between groups, and Cronbach's alpha, prior to performing any statistical analysis. The findings demonstrated that the Values of Cronbach's Alpha were more than 0.7, demonstrating the safety of the survey items both collectively and individually.

52.9% of the 121 responders were men, while 47.1% were women. Among the responders, 63.6% had a bachelor's degree, 28.1% a master's, and 8.3% a diploma. This shows that most respondents had a high level of education. The interviewees' prior employment history was also questioned. According to the findings, 29.8% of respondents had between 5 and 10 years of experience, 24.8% had between 10 and 15 years, 23.1% had less than 5 years, and 22.3% had more than 55 years.

Regarding numerous elements influencing the credit process, the respondents offered their viewpoints. The procedure of acquiring credit information, determining credit risk, approving credit, and disbursing credit were all deemed to be ineffective by the majority. Systems of information, analytical techniques, management data, and insufficient data to appropriately analyze the risk profile of the borrower or counterparty left them dissatisfied. They were also dissatisfied with the financial and credit bureau reports. The absence of periodic internal evaluations of the credit-granting and administration activities of a bank, as well as the lack of identification and assessment of modifications to the credit risk management system, were also mentioned by the respondents. The respondents believed that there was a lack of openness and thorough disclosure of the risks, approvals in line with bank policies, specialized credit groups, and unambiguous auditing.

The rules and procedures in place, ongoing management of credit risk portfolios, updating of credit files, collecting up-to-date financial information, renewal letters, and document preparation were all aspects of monitoring and follow-up activities that the respondents were

happy with. They were also appreciative of the processes in place for keeping an eye on specific credits, establishing the sufficiency of provisions and reserves, and keeping an eye on the composition and general caliber of the credit portfolio.

According to the results of the Pearson correlation test, the efficiency of the credit risk management system and Positive correlations exist between the availability of credit information and credit approval, disbursement, monitoring, and follow-up. The corresponding Pearson correlation coefficients were 0.643, 0.785, 0.870, 0.872, and 0.875 for each variable. This demonstrates that the independent and dependent variables have a meaningful association.

Additionally, the modified coefficient of determination (R2) from the multiple regression analysis showed that these three variables accounted for around 88.6% of the variation in the effectiveness of the credit risk management system. The remaining 11.4% of the variation was due to other factors.

These conclusions led to an estimation of the possible influence of the independent factors on the dependent variable (the efficiency of the credit risk management system). The dependent variable was shown to be positively and statistically significantly impacted by all the other factors, with the exception of credit assessment, with estimating coefficient values of 0.073, 0.280, 0.186, and 0.356, respectively.

## 5.2 Conclusion

In conclusion, the goal of this study was to learn more about the elements that influence how well commercial banks' credit risk management programmes work. The results of the study showed that there is room for improvement in the credit application, approval, and disbursement processes, with a significant portion of the participants expressing dissatisfaction. The study identified credit information, credit approval, credit disbursement, monitoring, and follow-up as key factors that favourably impact the effectiveness of credit risk management in commercial banks using both multiple regression and correlation analysis. The positive coefficient values show a significant positive correlation between these factors and the efficiency of the banks' credit risk management programmes.

The research's conclusions have significant ramifications for commercial banks looking to improve their credit risk management programmes. Banks can increase their effectiveness in managing credit risk and thereby lower the likelihood of financial losses by giving priority to

these important factors. This study also lays the groundwork for future research that may look into additional variables influencing credit risk management in commercial banks.

It's crucial to remember that the study has some restrictions. For instance, because the sample size was restricted to a single geographic area, the results may not be generalizable to other areas. Additionally, because the study only examined commercial banks, other financial institutions may not be affected by the findings. By increasing the sample size and taking into account different kinds of financial institutions, future research might try to overcome these restrictions.

In conclusion, this research offers important insights into the variables influencing credit risk management effectiveness in commercial banks. Prioritizing credit information, credit approval, credit disbursement, monitoring, and follow-up will help banks improve their credit risk management programmes and boost their overall financial performance.

## 5.3 Recommendations

The research's findings have led to the following suggestions, which are put out.

- It was discovered that credit information had a direct, favorable, and considerable impact on the credit risk management system's effectiveness. Credit information sharing lowers write-off losses, raises non-performing loan ratios, and lowers interest rates for good credit risks. Additionally, it broadens both the market and financial access. So that they may implement a successful Commercial bank should implement a credit risk management system prioritize credit information.
- The results also point to a direct, favorable, and substantial influence of loan approval on the efficiency of the system for managing credit risk. A successful credit risk management system depends on a clear and thorough presentation of risks during the loan approval process, in compliance with the bank's policies. Commercial banks ought to enhance their credit approval procedure as a result.
- The study discovered that credit disbursement also has a favorable and considerable impact on the efficiency of commercial banks' system for managing credit risk. The banking industry's credit risk management system must operate with clearly defined credit disbursement criteria and good credit regulations. Therefore, commercial banks want to make improvements to their credit disbursement procedure.
- It was discovered that monitoring and execution had a beneficial effect on how well the credit risk management system worked. An efficient system for managing credit risk process

depends on having adequate rules and methods for detecting, assessing, tracking and regulating credit risks. Banks must therefore improve their oversight and follow-up of credit management procedures.

Finally, further studies are recommended to identify other elements that influence credit risk's effectiveness in the banking industry.

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