

**RISK MANAGEMENT PRACTICES WITH REFERENCE TO
CREDIT RISK MANAGEMENT AMONG THE SELECTED
BANKS IN MIZORAM**

**A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
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RISK MANAGEMENT PRACTICES WITH REFERENCE TO CREDIT RISK
MANAGEMENT AMONG THE SELECTED BANKS IN MIZORAM

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Submitted

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CERTIFICATE

This is to certify that the thesis entitled “*Risk Management Practices with Reference to Credit Risk Management among the Selected Banks in Mizoram*” submitted to Mizoram University for the award of the Degree of Doctor of Philosophy in Commerce is a research work carried out by Mr. Albert Lalrinsanga Hauhnar, Research Scholar in the Department of Commerce, Mizoram University under my supervision and that it has not been previously submitted for the award of any research degree to any other university/institute.

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DECLARATION

I, *Albert Lalrinsanga Hauhnar*, hereby declare that the subject matter of this thesis is the record of work done by me, that the contents of this thesis did not form basis of the award of any previous degree to me or to do the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any research degree in any other University/Institute.

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CHAPTER -1

INTRODUCTION

In recent years, risk management has become a vital foundation for banks, helping them stay stable and succeed in a fast-changing financial world. With challenges piling up to economic ups and downs, tougher regulations, rapid tech changes, and growing cyber threats, banks need strong risk management more than ever. This means diving into the complex world of risk management to see how banks tackle these issues to protect their operations, keep customers' trust, and build a future that lasts. In today's high-stakes environment, managing risks isn't just about following rules; it's a key strategy that shapes the path forward for banking.

1.1 Principles of Risk Management

The International Organization for Standardization (ISO) has developed comprehensive guidelines for risk management through its widely recognized standard, ISO 31000. First published in 2009 and updated in 2018, ISO (2018) provides a structured framework to help organizations of all types and sizes manage risks effectively. These standards outline principles, a framework, and a process for risk management, emphasizing its integration into organizational governance and decision-making. ISO (2018) establishes eight core principles that serve as the foundation for effective risk management. These principles are designed to ensure that risk management is purposeful, systematic, and aligned with an organization's objectives. They are as follows:

- i. **Integrated:** Risk management should be an integral part of all organizational activities, embedded in processes, decision-making, and culture rather than treated as a standalone function.
- ii. **Structured and Comprehensive:** A systematic and thorough approach ensures consistent and reliable outcomes, addressing risks in a holistic manner.
- iii. **Customized:** The risk management framework and processes must be tailored to the organization's specific context, objectives, and external environment.

- iv. Inclusive: Engaging relevant stakeholders—employees, management, and external parties—ensures diverse perspectives, fostering better risk identification and treatment.
- v. Dynamic: Risk management must be responsive to change, adapting to evolving internal and external conditions, such as market shifts or technological advancements.
- vi. Best Available Information: Decisions should be based on the most current, accurate, and comprehensive data, while acknowledging limitations and uncertainties.
- vii. Human and Cultural Factors: The process must account for human behavior, perceptions, and organizational culture, which significantly influence risk management effectiveness.
- viii. Continual Improvement: Organizations should regularly assess and refine their risk management practices, learning from experience to enhance performance over time.

These principles are not prescriptive rules but guiding concepts that allow flexibility for organizations to adapt risk management to their unique needs. According to ISO, the purpose of these principles is to create and protect value by improving decision-making, enhancing resilience, and supporting the achievement of objectives amidst uncertainty (ISO, 2018).

1.2 Risk Management Process

While risk management as a concept has evolved over time through contributions from various fields (e.g., finance, engineering, and project management), ISO 31000, first published in 2009 and revised in 2018, formalized and popularized this structured process on a global scale. It provides a standardized, widely applicable framework that organizations, including banks, use to systematically manage risks. ISO 31000:2018 outlines the risk management process in a clear, iterative sequence that includes the following key stages:

1.2.1 Risk Identification

The initial step in risk management is all about pinpointing and describing potential risks that could hinder a bank’s ability to meet its goals. This requires a deep dive into the bank’s internal workings—such as its day-to-day operations—and external factors, like market conditions or what stakeholders expect. According to ISO 31000, using structured methods like brainstorming sessions, detailed checklists, or scenario planning helps uncover both risks, such as loan defaults or cyberattacks, and opportunities that might otherwise be missed. By involving a wide range of voices—employees, leaders, and even external partners—and grounding decisions in the best available data, banks can build a thorough list of risks. This comprehensive risk inventory lays the groundwork for the next stages of the process, ensuring nothing critical slips through the cracks (ISO, 2018).

1.2.2 Risk Analysis

Risk analysis is about getting to the heart of each identified risk—figuring out what causes it, how likely it is to happen, and what kind of impact it could have. This involves digging deeper, using tools like risk matrices for a qualitative approach or statistical models for a more data-driven take, depending on what information is available and what the bank needs. ISO 31000 emphasizes looking at existing safeguards, checking how well they work, and being honest about any gaps or uncertainties in the data. For example, when analyzing a risk like market volatility, a bank might study past trends, economic signals, and potential financial hits. This step is crucial, as ISO 31000 highlights, because it provides the clear insights needed to decide which risks matter most and guide smart decision-making (ISO, 2018).

1.2.3 Risk Assessment

Risk assessment brings together the insights from risk analysis and evaluation to figure out which risks matter most and whether they need immediate action. While ISO 31000 sometimes separates analysis and evaluation, in practice, they often blend into a single “assessment” process. Here, banks compare risks against clear benchmarks—like their risk appetite, tolerance limits, or regulatory requirements—to

decide if they're manageable or demand attention. This helps prioritize resources, focusing on the biggest threats. For example, a bank might determine that a cybersecurity breach risk is too high, triggering urgent steps to address it. ISO 31000 stresses that this process should stay flexible, adapting to new data or shifting conditions to keep risks in check (ISO, 2018).

1.2.4 Risk Mitigation (Risk Treatment)

Risk mitigation is about choosing and putting into action practical strategies to tackle risks based on what the assessment reveals. ISO 31000 suggests options like steering clear of a risk (e.g., pulling out of a risky market), reducing it (e.g., beefing up internal controls), transferring it (e.g., using insurance), or accepting it if it fits with the bank's goals. These plans need to be realistic, cost-effective, and sized right for the risk, with clear roles assigned to make them happen. For example, to tackle the risk of loan defaults, a bank might tighten its lending rules or spread its investments across diverse portfolios. ISO 31000 highlights the importance of regularly checking if these strategies are working, ensuring risks stay under control over time while supporting the bank's aim to create and protect value (ISO, 2018).

1.3 Risk Management in Financial Institutions

Risk management in banks is about systematically spotting, analyzing, evaluating, and tackling uncertainties that could threaten their financial health, day-to-day operations, or public image. It's a vital task for banks, investment firms, and other financial players, who face a range of risks: credit risk (borrowers defaulting on loans), market risk (such as fluctuation in interest rates or stock prices), operational risk (system crashes or fraud), liquidity risk (not having enough cash to cover immediate needs), and regulatory risk (penalties for not following rules). Using frameworks like ISO 31000, banks set the stage by understanding their environment, weigh potential impacts, and roll out strategies—like spreading out loans, hedging bets, or tightening controls—to cut losses while making the most of opportunities. In today's complex, interconnected global economy, solid risk management keeps

banks strong, trustworthy, and compliant with strict regulations, protecting both themselves and the broader financial system.

Over the years, the Basel Accords, crafted by the Basel Committee on Banking Supervision (BCBS), have set global standards for managing these risks, especially through rules on holding enough capital:

- **Basel I (1988):** Laid the groundwork with a minimum 8% capital adequacy ratio for risk-weighted assets, focusing mainly on credit risk. It assigned risk weights (e.g., 0% for government bonds, 100% for corporate loans) to ensure banks had enough capital to handle losses. Its simplicity, however, missed market and operational risks, leading to further updates.
- **Basel II (2004):** Broadened the approach with three pillars—capital requirements, supervisory oversight, and market transparency. It fine-tuned credit risk calculations, added market and operational risks to the mix, and let banks use their own models (with regulatory approval) for flexibility. But the 2008 financial crisis exposed flaws in its reliance on self-regulation, calling for tougher rules.
- **Basel III (2013 onwards):** Strengthened banks after the crisis by demanding higher-quality capital, stricter liquidity rules, and extra buffers for tough times. It kept the 8% capital ratio (with at least 6% in Tier 1 capital) and added a 2.5% Capital Conservation Buffer. New standards like the Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR) ensured banks could handle short- and long-term cash crunches.

In India, the Reserve Bank of India (RBI) standardizes these global standards to fit the local market. While Basel III sets an 8% capital ratio, RBI requires 9% for commercial banks and a stricter 12% for public sector banks, recognizing their key role and higher risks (Srinivasan and Britto, 2017). These tougher rules push banks to hold more capital, reducing risky borrowing and boosting resilience against issues like non-performing assets (NPAs). Beyond capital, banks use tools like credit scoring, stress tests, and audits, alongside ISO 31000 principles, to manage risks. For example, they diversify loans to limit credit risk, use derivatives to hedge market risk, strengthen IT systems to tackle operational risks, and keep cash reserves for

liquidity. Together, Basel and RBI rules help banks balance bold moves with financial stability, protecting customers and the economy.

1.3.1 Credit Risk

Credit risk is a major concern for banks, stemming from the chance that borrowers won't repay loans, like mortgages or business financing. Defaults, especially during economic slumps, can hit a bank's finances hard, with rising NPAs straining balance sheets. Banks manage this by thoroughly checking borrowers' creditworthiness, setting lending caps, spreading loans across different sectors, and setting aside funds for potential losses. Basel II and III stress holding enough capital to cover defaults, keeping banks solvent. In India, where public sector banks often lend to riskier sectors, credit risk remains a top priority.

1.3.2 Market Risk

Market risk comes from unexpected changes in things like interest rates, exchange rates, or stock prices, which can hurt a bank's trading assets. For instance, a sudden rate hike might lower the value of bonds, or currency shifts could affect foreign exchange holdings. Banks counter this with hedging tools like swaps or options, stress tests to predict losses, and Value-at-Risk (VaR) models to measure exposure. Basel II set capital rules for market risk, refined in Basel III, ensuring banks stay strong against market shocks, a lesson driven home by the 2008 crisis.

1.3.3 Operational Risk

Operational risk covers losses from flawed processes, human mistakes, or external events like cyberattacks or fraud. A data breach, for example, could lead to fines and lost trust. Banks tackle this by investing in strong IT systems, training staff, setting up internal controls, and buying insurance. Basel II added operational risk to capital requirements, pushing banks to measure it with standardized or advanced methods. As digital banking grows, cybersecurity has become a critical focus, with banks constantly adapting to new threats.

1.3.4 Liquidity Risk

Liquidity risk arises when a bank can't cover short-term cash needs, like during a "bank run" or when funding markets freeze. The 2008 crisis showed how serious this can be. Banks manage it by keeping cash reserves, securing borrowing lines, and holding high-quality liquid assets (HQLA) as required by Basel III's Liquidity Coverage Ratio. The Net Stable Funding Ratio ensures long-term funding stability, helping banks stay ready for unexpected shocks while meeting customer and creditor demands.

1.3.5 Regulatory Risk

Regulatory risk comes from failing to follow laws or guidelines, which can lead to fines or restrictions. Banks face strict rules, from Basel III to anti-money laundering laws. Missing capital targets, for instance, could prompt regulatory action. Banks manage this with compliance programs, regular audits, and close ties with regulators to keep up with changing rules. In India, public sector banks face a 12% capital ratio requirement, balancing regulatory demands with business goals (Srinivasan and Britto, 2017).

1.3.6 Reputational Risk

Reputational risk stems from negative public views, like scandals or poor service, which can scare off customers and investors. Trust is everything for banks, and a high-profile issue, like mis-selling products, can hit profits hard. Though not part of Basel, it's tied to other risks like operational or regulatory issues. Banks manage it with clear communication, strong governance, and quick crisis response, knowing that trust is as valuable as capital in a competitive market.

1.4 The Evolution of Risk Management in Indian Banking

Since India's independence in 1947, its banking sector has transformed from a tightly controlled, state-led system to a vibrant, market-driven industry connected to global finance. Shaped by economic policies, regulatory changes, and technology, this journey has made risk management a cornerstone of banking strategy. Early on, banks focused on financial inclusion and social goals, facing few risks in a protected

market but lacking efficiency. The 1991 liberalization reforms opened the door to new risks—credit, market, operational, and tech-related—while sparking competition and modernization. What was once a basic, compliance-focused task has become a strategic must-have, guided by global standards like Basel and the need to navigate a complex financial world.

1.4.1 The Post-Independence Era (1947–1969): A State-Driven Banking System

Following India’s independence, the banking sector was shaped by nation-building goals, economic self-reliance, and financial inclusion. The Reserve Bank of India (RBI), established in 1935 and nationalized in 1949, became the central authority for monetary policy and banking regulation (Reserve Bank of India, 2008). The sector was dominated by private banks, many of which were small, regionally focused, and prone to instability due to inadequate capital and weak governance (Chandrasekhar & Ghosh, 2002). Risk management during this period was minimal, as banks operated in a low-competition environment with limited market risk exposure. Credit risk was managed through conservative lending to established businesses, while operational risks were addressed via manual processes and basic oversight.

The government’s economic policies emphasized social control to align banking with development objectives. The Banking Regulation Act of 1949 empowered the RBI to regulate banks, enforce prudential norms, and prevent failures, laying the groundwork for early risk management frameworks. However, the focus on urban elites and industrial financing neglected rural and agricultural needs, prompting calls for reform. Risk management was reactive, centered on compliance with RBI directives, with little emphasis on proactive strategies or quantitative risk assessment. The lack of global integration and limited technological infrastructure constrained the development of sophisticated risk management practices.

1.4.2 Nationalization and Social Control (1969–1991): Expansion and Regulation

The nationalization of 14 major commercial banks in 1969, followed by six more in 1980, marked a pivotal shift in Indian banking. Driven by a socialist agenda, nationalization aimed to expand banking services to rural areas, support priority sectors (e.g., agriculture, small-scale industries), and reduce financial exclusion (Reserve Bank of India, 2008). Public sector banks (PSBs) dominated, accounting for over 80% of deposits and credit by 1991. This period saw significant branch expansion, with bank branches increasing from 8,262 in 1969 to 60,220 by 1990, enhancing access but straining operational efficiency (Joshi & Little, 1996).

Risk management remained underdeveloped due to the highly regulated environment. The RBI's prescriptive guidelines on interest rates, credit allocation, and liquidity ratios minimized market and credit risks but stifled innovation (Reddy, 2002). Credit risk was exacerbated by directed lending to priority sectors, often at subsidized rates, which increased non-performing assets (NPAs) due to lax appraisal standards and political interference. Operational risks arose from manual processes and inadequate controls, while systemic risks were mitigated by government backing of PSBs. The absence of competition and global exposure limited the need for advanced risk management tools, and banks relied on RBI inspections for compliance. The prioritization of social objectives over profitability obscured the importance of risk management, setting the stage for post-liberalization challenges.

1.4.3 Liberalization and Reforms (1991–2000): Opening the Sector to Competition

The 1991 economic crisis, characterized by a balance-of-payments deficit and depleted foreign reserves, prompted sweeping liberalization reforms that transformed Indian banking. The Narasimham Committee I (1991) and II (1998) reports recommended deregulation, competition, and prudential regulation to enhance efficiency and stability (Narasimham, 1991, 1998). Key reforms include reducing the Cash Reserve Ratio (CRR) and Statutory Liquidity Ratio (SLR), liberalizing interest

rates, allowing private and foreign banks to enter, and adopting Basel I capital adequacy norms.

Liberalization exposed banks to new risks, necessitating advanced risk management practices. Credit risk increased as banks expanded lending, prompting the RBI to introduce asset classification and provisioning norms in 1992 to address NPAs (Reserve Bank of India, 2008). Market risk emerged with deregulated interest and exchange rates, leading to the adoption of tools like Value-at-Risk (VaR) models. Operational risks grew due to rapid branch expansion and early computerization, spurring investments in internal controls. The RBI's adoption of Basel I in 1992 mandated a minimum Capital to Risk-Weighted Assets Ratio (CRAR) of 8%, compelling banks to strengthen capital buffers and risk assessment (Bhaumik, 2010). Private Banks, such as ICICI and HDFC, introduced modern risk management practices, challenging PSBs to upgrade. However, PSBs struggled with rising NPAs (gross NPA ratio reached 15.7% in 1996) and weak governance, highlighting the need for robust risk management frameworks (Reddy, 2002).

1.4.4 Consolidation and Modernization (2000–2010): Aligning with Global Standards

The early 2000s marked a phase of consolidation and modernization to enhance global competitiveness and address systemic weaknesses. The RBI's Roadmap for Banking Sector Reforms (2005) emphasized risk-based supervision, corporate governance, and technology adoption (Reserve Bank of India, 2005). The adoption of Basel II norms in 2009 introduced advanced risk management frameworks, including the Internal Ratings-Based (IRB) approach for credit risk and standardized models for market and operational risks (Reserve Bank of India, 2009). Banks invested in risk management systems, such as credit scoring, stress testing, and enterprise risk management (ERM) frameworks, to comply with Basel II's three pillars: minimum capital requirements, supervisory review, and market discipline.

Technology transformed operations, with core banking solutions (CBS), ATMs, and internet banking improving efficiency but introducing cybersecurity and data privacy risks (KPMG, 2006). The RBI's guidelines on operational risk

management (2005) and information security (2007) mandated robust controls, including fraud detection and disaster recovery plans (Reserve Bank of India, 2005, 2007). Credit risk remained a challenge, with NPAs declining to 2.3% by 2010 due to economic growth but rising during the global financial crisis (2008–2009), which exposed vulnerabilities in corporate lending (Chandrasekhar & Ghosh, 2010). The RBI's counter-cyclical provisioning and liquidity support shielded banks from severe impacts, underscoring the importance of regulatory oversight in risk management.

1.4.5 Post-Global Financial Crisis and Digital Transformation (2010–2020): Strengthening Resilience

The 2008–2009 global financial crisis highlighted the need for resilient banking systems, prompting accelerated reforms. The phased adoption of Basel III norms (2013–2019) raised capital requirements, introduced leverage ratios, and mandated liquidity coverage ratios (LCR) to enhance shock resilience (Reserve Bank of India, 2013). The RBI's Asset Quality Review (AQR) in 2015 exposed hidden NPAs, leading to a gross NPA ratio of 9.3% in 2017 and necessitating stricter provisioning and resolution mechanisms, such as the Insolvency and Bankruptcy Code (IBC) of 2016 (Reserve Bank of India, 2017). These measures improved credit risk management by enhancing loan recovery and transparency.

The digital revolution transformed banking, with mobile banking, Unified Payments Interface (UPI), and fintech platforms increasing transaction volumes but introducing cybersecurity risks, with frauds rising by 28% between 2015 and 2019 (Reserve Bank of India, 2019). The RBI's cybersecurity framework (2016) mandated multi-factor authentication, encryption, and incident response systems (Reserve Bank of India, 2016). Operational risk management evolved with advanced analytics and machine learning for fraud detection and credit scoring. PSBs faced governance lapses and capital constraints, leading to government-led consolidation (e.g., merger of 10 PSBs into four in 2020) to enhance efficiency and risk resilience (Ministry of Finance, 2020).

1.4.6 The Contemporary Era (2020–2025): Navigating New Frontiers in Risk Management

Since 2020, the Indian banking sector has faced unprecedented challenges, including the COVID-19 pandemic, technological disruptions, and evolving regulatory expectations. The pandemic strained asset quality, with gross NPAs rising to 7.5% in 2021 due to loan moratoriums and economic slowdowns (Reserve Bank of India, 2021). The RBI's moratorium policies, restructuring frameworks, and emergency credit lines mitigated systemic risks, while stress tests ensured resilience. Post-pandemic recovery, supported by economic growth (GDP growth of 7.2% in 2023), reduced NPAs to 3.9% by 2024, reflecting improved risk management (Reserve Bank of India, 2024).

Technology has redefined risk management, with artificial intelligence (AI), blockchain, and big data analytics enhancing credit risk assessment, fraud detection, and operational efficiency. AI-based credit scoring models have reduced default rates by 15% in leading private banks (Deloitte, 2022). However, digitalization has escalated cybersecurity risks, with cyberattacks increasing by 40% between 2020 and 2024 (PwC, 2023). The RBI's Digital Banking Framework (2022) and Data Protection Guidelines (2023) mandate zero-trust architectures and real-time monitoring (Reserve Bank of India, 2022, 2023a). The adoption of Expected Credit Loss (ECL) provisioning under Ind AS (2023) aligns with global standards, improving credit risk forecasting (Reserve Bank of India, 2023b). Climate risk has emerged as a new frontier, with the RBI's 2024 guidelines requiring banks to assess environmental risks in lending portfolios (Reserve Bank of India, 2024). In Mizoram, banks like SBI, MRB, and MCAB face challenges such as limited digital infrastructure and high priority-sector lending, which elevate credit and operational risks but benefit from RBI's regional support schemes.

1.5 Priority Sector Lending

At an important meeting of the National Credit Council convened in July 1968, a strong call was made for commercial banks to deepen their engagement in financing what would come to be known as priority sectors—segments of the

economy deemed essential for fostering equitable growth and development. This marked a turning point in the role of banking institutions, urging them to shift focus toward areas traditionally underserved by credit systems. At that initial stage, no specific targets were imposed on banks for lending to these sectors. The government in 1974 advised commercial banks to escalate their lending to priority sectors to constitute 33 1/3% of their aggregate advances by March 1979.

A further commitment emerged in 1980, when banks collectively agreed to elevate the share of priority sector advances to 40% of their total lending portfolio by March 1985. In a subsequent development, the RBI constituted an Internal Working Group chaired by Shri C.S. Murthy to conduct a comprehensive review of the existing guidelines governing priority sector advances. Based on the recommendations made in September 2005, the targets and sub-targets under priority sector lending started linking to Adjusted Net Bank Credit (ANCB). It has been decided to include only those sectors as part of the priority sector, that impact large sections of the population, the weaker sections and the sectors which are employment-intensive such as agriculture, and tiny and small enterprise.

Thereafter, the RBI has set up Nair Committee in August 2011 under the chairmanship of MV Nair to re-examine the existing classification and suggest revised guidelines with regard to Priority Sector lending classification and related issues. The RBI has modified Priority Sector Lending norms after the recommendation of the Internal Working Group in 2015.

Priority Sector refers to those sectors of the economy which may not get timely and adequate credit in the absence of this special dispensation such as those sectors that impact large sections of the population and sectors which are highly employment intensive. At its core, the concept of priority sectors encompasses those segments of the economy that, in the absence of deliberate intervention, might struggle to secure timely and sufficient credit from traditional banking channels. Through this evolving framework, priority sector lending has emerged as a cornerstone of financial inclusion, balancing commercial banking objectives with the broader imperatives of social and economic equity.

1.5.1 Priority Sector Lending includes Lending to the following Categories (IIBF, 2018):

Agriculture: The activities covered under Agriculture are classified under three sub-categories viz., Farm credit, Agriculture infrastructure and Ancillary activities. RBI has directed all the banks to put in all-out efforts to reach the level of 13.5 per cent direct lending to the beneficiaries who earlier constituted the direct agriculture sector. Finance to agriculture includes short term and long term loans given for agriculture and allied activities (dairy, fishery, piggery, poultry, bee-keeping, etc) directly to individual farmers, Self Help Groups (SHGs) or Joint Liability Groups (JLGs) of individual farmers without limit and to others (such as corporate, partnership firms and institutions) upto certain limits for taking up agriculture/allied activities.

Farm Credit: Under farm Credit, Direct finance include:-

- a) Loans to individual farmers {Self Help Groups (SHGs) or Joint Liability Groups (JLGs)} and Proprietorship firms of farmers, directly engaged in Agriculture and Allied Activities. viz., dairy farming, fishery, animal husbandry, poultry, bee-keeping and sericulture.
- b) Loans to corporate farmers, farmer's producer organizations/companies of individual farmers, partnership firms and co-operatives of farmers directly engaged in Agriculture and Allied Activities viz., dairy farming, fishery, animal husbandry, poultry, bee-keeping and sericulture up to an aggregate limit of Rs.2 crore per borrower.

Agriculture Infrastructure: Direct Finance include

- a) Loans for construction of storage facilities (warehouses, market yards, godowns and silos) including cold storage chains designed to store agriculture produce/products, irrespective of their locations.
- b) Soil conservation and water shed development.
- c) Plant tissue culture and agri-biotechnology, seed production, production of bio-pesticides. Bio-fertilizer, and vermin composting

For the above loans, an aggregate sanctioned limit of Rs. 100 crore per borrower from the banking system, will apply.

Ancillary Activities (IBF, 2018):

- a) Loans up to Rs. 5 crore to co-operative societies of farmers for disposing of the produce of members.
- b) Loans for setting up of Agri-clinics and Agribusiness Centres.
- c) Loans for Food and Agro-processing up to an aggregate sanctioned limit of Rs. 100 crore per borrower from the banking system.
- d) Loans to Custom Service Units managed by individuals, institutions or organizations who maintain a fleet of tractors, bulldozers, well-boring equipment, threshers, combines, etc., and undertake farm work for farmers on contract basis.
- e) Outstanding deposits under RIDF and other eligible funds with NABARD on account of priority sector shortfall.

For the purpose of computation of achievement of the sub-target, Small and Marginal Farmers will include the following: -

- a) Farmers with landholding of up to 1 hectare (Marginal Farmers). Farmers with a landholding of more than 1 hectare and up to 2 hectares (Small Farmers).
- b) Landless agricultural labourers, tenant farmers, oral lessees and share-croppers, whose share of landholding is within the limits prescribed for small and marginal farmers.
- c) Loans to Self Help Groups (SHGs) or Joint Liability Groups (JLGs), i.e. groups of individual Small and Marginal farmers directly engaged in Agriculture and Allied Activities, provided banks maintain disaggregated data of such loans.
- d) Loans to farmers' producer companies of individual farmers, and co-operatives of farmers directly engaged in Agriculture and Allied Activities, where the membership of Small and Marginal Farmers is not less than 75 per

cent by number and whose land-holding share is also not less than 75 per cent of the total land-holding.

Micro, Small and Medium Enterprises (MSMEs): The limits for investment in plant and machinery/equipment for manufacturing/service enterprise, as notified by Ministry of Micro, Small and Medium Enterprises, *vide* S.O. 1642(E) dated September 9,2006 are as under:-

Table: 1.1 : Classification of MSME

Manufacturing Sector	
Enterprises	Investment in Plant and Machinery
Micro Enterprises	Does not exceed one crore rupees, and annual turnover not more than five crore rupees
Small Enterprises	More than one crore rupees but does not exceed ten crore rupees, and annual turnover not more than fifty crore rupees
Medium Enterprises	More than ten crore rupees but does not exceed fifty crore rupees, and annual turnover not more than two fifty crore rupees
Service Sector	
Enterprises	Investment in Equipment
Micro Enterprises	Does not exceed ten lakh rupees
Small Enterprises	More than ten lakh rupees but does not exceed two crore rupees
Medium Enterprises	More than two crore rupees but does not exceed five crore rupees.

Source: msme.gov.in

Bank loans to Micro, Small and Medium Enterprises, for both manufacturing and service sectors are eligible to be classified under the priority sector.

Manufacturing Enterprises

The Micro, Small and Medium Enterprises engaged in the manufacture or production of goods to any industry specified in the first schedule to the Industries (Development and Regulation) Act, 1951 and as notified by the Government from time to time. The Manufacturing Enterprises are defined in terms of investment in plant and machinery.

Service Enterprises

All bank loans to MSMEs, engaged in providing or rendering of services as defined in terms of investment in equipment under MSMED Act, 2006, shall qualify under priority sector without any credit cap.

Factoring Transactions

- a) Factoring transactions on ‘with recourse’ basis by banks which carry out the business of factoring departmentally, wherever the ‘assignor’ is a Micro, Small or Medium Enterprise, subject to the corresponding limits for investment in plant and machinery/ equipment and other extant guidelines for priority sector classification. Such outstanding factoring portfolios may be classified by banks under MSME category on the reporting dates.
- b) In terms of paragraph 9 of the Department of Banking Regulation Circular DBR.No. FSD.BC.32/24.01.007/2015-16 dated July 30, 2015 on ‘Provision of Factoring Services by Banks- Review’, inter-alia, the borrower’s bank shall obtain from the borrower, periodical certificates regarding factored receivables to avoid double financing/ counting. Further, the ‘factors’ must intimate the limits sanctioned to the borrower and details of debts factored to the banks concerned, taking responsibility to avoid double financing.
- c) Factoring transactions taking place through the Trade Receivables Discounting System (TReDS) shall also be eligible for classification under priority sector upon operationalization of the platform.

Khadi and Village Industries Sector (KVI): All loans to units in the KVI sector will be eligible for classification under the sub-target of 7.5 per cent prescribed for Micro Enterprises under priority sector.

Other Finance to MSMEs

- a) Loans to entities involved in assisting the decentralized sector in the supply of inputs to and marketing of outputs of artisans, village and cottage industries.
- b) Loans to co-operatives of producers in the decentralized sector viz. artisans, village and cottage Industries.
- c) Credit outstanding under General Credit Cards (including Artisan Credit Card, Laghu Udyami Card, Swarojgar Credit Card, and Weaver's Card etc. in existence and catering to the non-farm entrepreneurial credit needs of individuals).
- d) In terms of revised guidelines issued by Department of Financial Services, Ministry of Finance, dated September 24, 2018, Overdraft limit to Pradhan Mantri Jan-Dhan Yojana (PMJDY) account holder has been raised to ₹10,000/-, age limit of 18-60 years has been revised to 18-65 years provided the borrower's household annual income does not exceed ₹100,000/- for rural areas and ₹1,60,000/- for non-rural areas and there will not be any conditions attached for overdraft up to ₹2,000/-. These overdrafts will qualify as achievement of the target for lending to Micro Enterprises.
- e) Outstanding deposits with SIDBI and MUDRA Ltd. on account of priority sector shortfall.

To ensure that MSMEs do not remain small and medium units merely to remain eligible for priority sector status, the MSME units will continue to enjoy the priority sector lending status up to three years after they grow out of the MSME category concerned.

Export Credit

During the first financial year of operation, Export Credit subject to a limit of up to ₹ 40 crore per borrower will be classified as priority sector. However, for subsequent financial years only incremental export credit over corresponding date of the preceding year, up to 2 per cent of ANBC shall be treated as priority sector.

Export credit includes pre-shipment and post-shipment export credit (excluding off-balance sheet items) as defined in Master Circular on Rupee / Foreign Currency Export Credit and Customer Service to Exporters issued by our Department of Banking Regulation.

Education: The Educational Loan Scheme aims at providing financial support from the banking system to meritorious students, though poor, for pursuing higher education in India and abroad. As per the extend guidelines, loans to individuals for educational purposes including vocational courses upto Rs. 10 lakh irrespective of the sanctioned amount will be eligible for being classified as priority sector advances.

Housing:

- a) Loans to individuals upto Rs. 35 lakh in metropolitan centres (with population of ten lakh and above) and loans upto Rs. 25 lakh in other centres for purchase/construction of a dwelling unit per family provided the overall cost of the dwelling unit in the metropolitan centre and at other centres should not exceed Rs. 45 lakh and Rs. 30 Lakh respectively. The housing loans to banks' own employees will be excluded. As housing loans which are backed by long term bonds are exempted from ANBC, banks should either include such housing loans to individuals up to ₹35 lakh in metropolitan centres and ₹25 lakh in other centres under priority sector or take benefit of exemption from ANBC, but not both.
- b) Loans for repairs to damaged dwelling units of families up to ₹5 lakh in metropolitan centres and upto ₹2 lakh in other centres.

- c) Bank loans to any governmental agency for construction of dwelling units or for slum clearance and rehabilitation of slum dwellers subject to a ceiling of ₹10 lakh per dwelling unit.
- d) The loans sanctioned by banks for housing projects exclusively for the purpose of construction of houses for Economically Weaker Sections (EWS) and Low Income Groups (LIG), the total cost of which does not exceed ₹10 lakh per dwelling unit. For the purpose of identifying the economically weaker sections and low-income groups, the family income limit is revised to ₹3 lakh per annum for EWS and ₹6 lakh per annum for LIG, in alignment with the income criteria specified under the Pradhan Mantri Awas Yojana.
- e) Outstanding deposits with NHB on account of priority sector shortfall.

Social Infrastructure: Bank loans up to a limit of ₹5 crore per borrower for building social infrastructure for activities namely schools, health care facilities, drinking water facilities and sanitation facilities including construction/refurbishment of household toilets and household level water improvements in Tier II to Tier VI centres.

Renewable Energy: Bank loans up to a limit of ₹15 crore to borrowers for purposes like solar based power generators, biomass-based power generators, wind mills, micro-hydel plants and for non-conventional energy based public utilities viz. street lighting systems, and remote village electrification. For individual households, the loan limit will be ₹10 lakh per borrower.

Others

- a) Loans not exceeding ₹50,000/- per borrower provided directly by banks to individuals and their SHG/JLG, provided the individual borrower's household annual income in rural areas does not exceed ₹1 lakh and for non-rural areas it does not exceed ₹1.6 lakh.
- b) Loans to distressed persons [other than farmers included under paragraph 6(6.1)(A)(v)] not exceeding ₹1 lakh per borrower to prepay their debt to non-institutional lenders.

- c) Loans sanctioned to State Sponsored Organisations for Scheduled Castes/ Scheduled Tribes for the specific purpose of purchase and supply of inputs and/or the marketing of the outputs of the beneficiaries of these organisations.

Weaker Sections: Priority sector loans to the following borrowers will be considered under Weaker Sections category:-

Table 1.2 : Classification of Weaker Sections

No.	Category
1.	Small and Marginal Farmers
2.	Artisans, village and cottage industries where individual credit limits do not exceed Rs. 1 lakh.
3.	Beneficiaries under Government Sponsored Schemes such as National Rural Livelihoods Mission (NRLM), National Urban Livelihood Mission (NULM) and Self Employment Scheme for Rehabilitation of Manual Scavengers (SRMS)
4.	Scheduled Castes and Scheduled Tribes
5.	Beneficiaries of Differential Rate of Interest (DRI)
6.	Self help Groups
7.	Distress farmers indebted to non-institutional lenders
8.	Distressed persons other than farmers, with loan amount not exceeding Rs. 1 lakh per borrower to prepay their debt to non-institutional lenders
9.	Individual women beneficiaries up to Rs. 1 lakh borrower
10.	Person with disabilities
11.	Overdraft upto Rs. 5000 under Pradhan Mantri Jan-Dhan Yojana (PM-JDY) accounts, provided the borrower's household annual income does not exceed Rs. 100000 for rural areas and Rs. 160000 for non-rural areas.
12.	Minority communities as may be notified by Government of India from time to time.

Source: IIBF, 2018

In States, where one of the minority communities notified is, in fact, in majority, item (xii) will cover only the other notified minorities. These States/ Union Territories are Jammu & Kashmir, Punjab, Meghalaya, Mizoram, Nagaland and Lakshadweep.

Investments by Banks in Securitised Assets

- a) Investments by banks in securitised assets, representing loans to various categories of priority sector, except 'others' category, subject to terms and conditions specified in Para 1.9 of the Operating Guidelines for SFBs issued by DBR vide their circular No. DBR.NDB.No.26/16.13.218/2016-17 dated October 6, 2016, are eligible for classification under respective categories of priority sector depending on the underlying assets provided:
 - the assets originated by banks and financial institutions are eligible to be classified as priority sector advances prior to securitisation and fulfil the Reserve Bank of India guidelines on securitisation.
 - the all-inclusive interest charged to the ultimate borrower by the originating entity should not exceed the MCLR of the investing bank plus 8 percent per annum.
- b) The investments in securitised assets originated by MFIs, which comply with the following guidelines are exempted from this interest cap as there are separate caps on margin and interest rate as under:
 - **Margin cap:** The margin cap should not exceed 10 percent for MFIs having loan portfolio exceeding ₹100 crore and 12 percent for others. The interest cost is to be calculated on average fortnightly balances of outstanding borrowings and interest income is to be calculated on average fortnightly balances of outstanding loan portfolio of qualifying assets.

A “qualifying asset” shall mean a loan disbursed by MFI, which satisfies the following criteria:

- The loan is to be extended to a borrower whose household annual income in rural areas does not exceed ₹1.25 lakh while for non-rural areas it should not exceed ₹2 lakhs.
- Loan does not exceed ₹75,000/- in the first cycle and ₹1.25 lakh in the subsequent cycles.
- Total indebtedness of the borrower does not exceed ₹1.25 lakh. Education and Medical expenses will be excluded while arriving at the total indebtedness of a borrower.
- Tenure of loan is not less than 24 months when loan amount exceeds ₹30,000/- with right to borrower of prepayment without penalty.
- The loan is without collateral.
- Loan is repayable by weekly, fortnightly or monthly installments at the choice of the borrower.
- Interest cap on individual loans: With effect from April 1, 2014, interest rate on individual loans will be the average Base Rate of five largest commercial banks by assets multiplied by 2.75 per annum or cost of funds plus margin cap, whichever is less. The average of the Base Rate shall be advised by Reserve Bank of India.
- Only three components are to be included in pricing of loans viz., (a) a processing fee not exceeding 1 percent of the gross loan amount, (b) the interest charge and (c) the insurance premium.
- The processing fee is not to be included in the margin cap or the interest cap
- Only the actual cost of insurance i.e. actual cost of group insurance for life, health and livestock for borrower and spouse can be recovered; administrative charges may be recovered as per IRDA guidelines.
- There should not be any penalty for delayed payment.
- No Security Deposit/ Margin is to be taken.

- c) Investments made by banks in securitised assets originated by NBFCs, where the underlying assets are loans against gold jewellery, are not eligible for priority sector status.

Transfer of Assets through Direct Assignment /Outright Purchases

- a) Assignments/Outright purchases of pool of assets by banks representing loans under various categories of priority sector, except the 'others' category, subject to terms and conditions specified in para 1.9 of the Operating Guidelines for SFBs issued by DBR vide circular No. DBR.NBD.No.26/16.13.218/2016-17 dated October 6, 2016 will be eligible for classification under respective categories of priority sector provided:
- the assets originated by banks and financial institutions are eligible to be classified as priority sector advances prior to the purchase and fulfil the Reserve Bank of India guidelines on outright purchase/assignment.
 - the eligible loan assets so purchased should not be disposed of other than by way of repayment.
 - the all-inclusive interest charged to the ultimate borrower by the originating entity should not exceed the MCLR of the purchasing bank plus 8 percent per annum.

The Assignments/Outright purchases of eligible priority sector loans from MFIs, are exempted from this interest rate cap as there are separate caps on margin and interest rate. as mentioned in Paragraph 15 (b) (i to vii)

- b) When the banks undertake outright purchase of loan assets from banks/ financial institutions to be classified under priority sector, they must report the nominal amount actually disbursed to end priority sector borrowers and not the premium embedded amount paid to the sellers.
- c) Purchase/ assignment/investment transactions undertaken by banks with NBFCs, where the underlying assets are loans against gold jewellery, are not eligible for priority sector status.

Inter Bank Participation Certificates:

Inter Bank Participation Certificates (IBPCs) bought by banks, on a risk sharing basis, are eligible for classification under respective categories of priority sector, provided the underlying assets are eligible to be categorized under the respective categories of priority sector and the banks fulfil the Reserve Bank of India guidelines on IBPCs and terms and conditions specified in Para 1.9 of the 'Operating Guidelines for SFBs' issued by DBR, vide circular No. DBR.NBD.NO.26/16.13.218/2016-17 dated October 6, 2016 on 'Credit risk transfer and portfolio sales/purchases'.

With regard to the underlying assets of the IBPC transactions being eligible for categorization under 'Export Credit' as per Para 8, the IBPC bought by banks, on a risk sharing basis, may be classified from purchasing bank's perspective for priority sector categorization. However, in such a scenario, the issuing bank shall certify that the underlying asset is 'Export Credit', in addition to the due diligence required to be undertaken by the issuing and the purchasing bank as per the guidelines in this regard.

Priority Sector Lending Certificates:

The outstanding priority sector lending certificates bought by banks will be eligible for classification under respective categories of priority sector provided the assets are originated by banks, are eligible to be classified as priority sector advances and fulfil the Reserve Bank of India guidelines on Priority Sector Lending Certificates issued vide Circular FIDD.CO.Plan.BC.23/04.09.001/2015-16 dated April 7, 2016 and terms and conditions specified in Para 1.9 of DBR circular No. DBR.NBD.26/16.13.218/2016-17 dated October 6, 2016 on credit risk transfer and portfolio sales/purchases.

Monitoring of Priority Sector Lending Targets:

To ensure continuous flow of credit to priority sector, the compliance of banks will be monitored on 'quarterly' basis. The data on priority sector advances

must be furnished by banks at quarterly and annual intervals as per the enclosed reporting formats.

Non-Achievement of Priority Sector Targets

- a) Small Finance Banks having any shortfall in lending to priority sector shall be allocated amounts for contribution to the Rural Infrastructure Development Fund (RIDF) established with NABARD and other Funds with NABARD/NHB/SIDBI/ MUDRA Ltd., as decided by the Reserve Bank from time to time. The achievement will be arrived at the end of financial year based on the average of priority sector target /sub-target achievement as at the end of each quarter.
- b) While computing priority sector target achievement, shortfall / excess lending for each quarter will be monitored separately. A simple average of all quarters will be arrived at and considered for computation of overall shortfall / excess at the end of the year. The same method will be followed for calculating the achievement of priority sector sub-targets.
- c) The interest rates on banks' contribution to RIDF or any other Funds, tenure of deposits, etc. shall be fixed by Reserve Bank of India from time to time.
- d) The misclassifications reported by the Reserve Bank's Department of Banking Supervision would be adjusted/ reduced from the achievement of that year, to which the amount of declassification/ misclassification pertains, for allocation to various funds in subsequent years.
- e) Non-achievement of priority sector targets and sub-targets will be taken into account while granting regulatory clearances/approvals for various purposes.

Common Guidelines for Priority Sector Loans:

Small Finance Banks should comply with the following common guidelines for all categories of advances under the priority sector.

- a) Rate of interest: The rates of interest on bank loans will be as per directives issued by our Department of Banking Regulation from time to time.

- b) Service charges: No loan related and adhoc service charges/inspection charges should be levied on priority sector loans up to ₹25,000. In the case of eligible priority sector loans to SHGs/ JLGs, this limit will be applicable per member and not to the group as a whole.
- c) Receipt, Sanction/Rejection/Disbursement Register: A register/ electronic record should be maintained by the bank, wherein the date of receipt, sanction/rejection/disbursement with reasons thereof, etc., should be recorded. The register/electronic record should be made available to all inspecting agencies.
- d) Issue of Acknowledgement of Loan Applications: Banks should provide acknowledgement for loan applications received under priority sector loans. Bank Boards should prescribe a time limit within which the bank communicates its decision in writing to the applicants.

1.6 Non-Priority Sector

While the framework of priority sector lending was established to channel credit to underserved and employment-intensive segments of the economy, the non-priority sector encompasses all other areas of lending that fall outside this special dispensation. At its core, the non-priority sector refers to those segments of the economy that can secure timely and sufficient credit without deliberate policy intervention. While priority sector lending has become a cornerstone of financial inclusion—balancing banking objectives with social equity—the non-priority sector represents the broader, often more commercially oriented lending portfolio of banks.

Non-priority sector lending appears to offer greater profitability potential compared to priority sector lending, primarily due to its market-driven nature, flexibility in interest rate setting, and focus on commercially viable borrowers such as large corporations and high-income individuals. Studies have suggested that banks can achieve higher returns in this segment by avoiding the low-interest, high-risk loans mandated under priority sector norms, which often target agriculture and weaker sections prone to default (Kumar, 2019). Gaur and Mohapatra (2021) highlight that priority sector lending's association with higher non-performing assets

(NPAs) contrasts with non-priority lending's flexibility, potentially enhancing profitability through higher margins and lower defaults. However, the perception of non-priority lending as less risky is not universally supported. Singh and Das (2023) caution that non-priority NPAs, particularly in industrial sectors, have surged due to fraud and economic downturns, challenging its safety. Patel and Gupta (2022) argue that non-priority lending's profitability depends on effective credit risk management, offering higher returns but not necessarily lower risk. Reserve Bank of India (2021) underscores that while non-priority lending benefits from flexible rates, it remains vulnerable to borrower concentration risks. Thus, non-priority lending is generally more profitable but not consistently less risky, with outcomes tied to banks' risk management and economic conditions.

1.7 Government Sponsored Schemes

India is a country where substantial portion of its population are living below or just above the poverty line. The country faces a persistent challenge that successive governments have sought to address through targeted schemes for poverty alleviation and eradication. It is widely acknowledged that government initiatives, especially those channeled through banking institutions, are instrumental in enhancing the economic conditions of rural areas (IIBF, 2018). Through affordable loans, grants, and other financial support, these programs open doors for rural households to access resources that would otherwise be out of reach, boosting their economic strength and resilience. The real impact of these schemes comes from their ability to jumpstart rural economies by tackling barriers to credit that hold back farming, small businesses, and income growth. Banks play a key role by channeling these funds, making sure rural communities—often left out of mainstream banking—can tap into government support. This flow of money helps people buy essentials like seeds or equipment, launch small ventures, and build sustainable ways to earn a living, driving progress at the grassroots level. By cutting reliance on predatory moneylenders and offering affordable credit, these initiatives empower rural families to escape poverty's grip. The partnership between government policies and banking

networks ensures these efforts reach far and wide, making them a vital pillar of rural development.

The following are the important schemes which are being implemented through commercial banks and cover the entire country- metro, urban, semi-urban and rural areas: They are:

1.7.1 *Deendayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM)*

DAY-NRLM is the flagship program of the Ministry of Rural Development (MoRD) for promoting poverty reduction through building strong institutions for the poor, particularly women, and enabling these institutions to access a range of financial services and livelihoods. DAY-NRLM adopts a demand-driven approach, enabling the States to formulate their own State-specific poverty reduction action plans. The blocks and districts in which all the components of DAY-NRLM would be implemented, either through the SRLMs or partner institutions or NGOs, would be the intensive blocks and districts, whereas the remaining would be non-intensive blocks and districts. National Rural Livelihood Mission (NRLM) is a restructured version of restructuring Swarnajayanti Gram Swarojgar Yojana (SGSY). NRLM was renamed as DAY-NRLM (Deendayal Antyodaya Yojana - National Rural Livelihoods Mission) w.e.f. March 29, 2016 (Ministry of Rural Development, 2016).

NRLM has set out with an agenda to cover 7 Crore rural poor households, across 600 districts, 6000 blocks, 2.5 lakh Gram Panchayats and 6 lakh villages in the country through self-managed Self Help Groups (SHGs) and federated institutions and support them for livelihoods collectives in a period of 8-10 years. In addition, the poor would be facilitated to achieve increased access to their rights, entitlements, and public services, diversified risk, and better social indicators of empowerment. NRLM believes in harnessing the innate capabilities of the poor and complements them with capacities (information, knowledge, skills, tools, finance, and collectivization) to participate in the growing economy of the country (Ministry of Rural Development, 2016).

Key benefits of the Scheme include (Ministry of Rural Development, 2016):

- i. One member (preferably a woman) from each rural poor household would be brought under the Self Help Group (SHG) network. Women SHG groups would have bank-linkage arrangements.
- ii. SHGs would be federated at the village level and higher levels to provide space, voice and resources and to reduce dependence on external agencies.
- iii. The Mission consists of four components, viz., (i) social mobilization, community institution, and capacity building; (ii) financial inclusion; (iii) livelihood promotion; and (iv) convergence.
- iv. The participatory social assessment would be organized to identify and rank all households according to vulnerability. The ranking would be with reference to the poorest of the poor, single woman and woman-headed households, disabled, landless, and migrant labor and they would receive special focus.
- v. Training and capacity building of the poor, particularly in relation to managing the institutions, livelihoods, credit absorption, and creditworthiness.
- vi. The Mission also supports the development of skills for rural youth and their placement, training, and self-employment through rural self-employment institutes (RSETIs), innovations, infrastructure creation, and market support.
- vii. Provision of Revolving Fund as support to SHGs to strengthen their institutional and financial management capacity and build a good credit history.
- viii. Provision of Community Investment Support Fund (CIF) in the intensive blocks to the SHGs through the Federations to advance loans and/or undertake common/collective socio-economic activities.
- ix. Introduction of financial inclusion model, loaning from banks, association and coordination with banking/financial institutions, and coverage from loss of life, health, etc.
- x. Provision of Interest Subvention on loans availed by SHGs to cover the difference between the lending rate of the banks and 7%.
- xi. Convergence with various ministries and agencies dealing with poverty reduction of rural poor.
- xii. With highly decentralized planning; States will have liberty in developing their own action plan for poverty reduction.

- xiii. NRLM to have suitable linkages at the district level with District Rural Development Agencies (DRDAs) and Panchayat Raj Institutions (PRIs).

1.7.2 *Deendayal Antyodaya Yojana* - National Urban Livelihoods Mission (DAY-NULM)

The scheme has the objective of reducing poverty and vulnerability of urban poor households by enabling them to access gainful self-employment and skilled wage employment opportunities, in order to improve their livelihoods on a sustainable basis, through building strong grassroots level institutions of the urban poor. The mission aims at providing shelters equipped with essential services to the urban homeless. In addition, the Mission addresses livelihoods concerns of the urban street vendors by facilitating access to suitable spaces, institutional credit, social security, etc (Ministry of Housing and Urban Affairs, 2013).

The Employment through Skill Training & Placement (EST&P) component under the Mission aims to provide skill training to urban poor in market-oriented courses, enabling them to set up self-employment ventures or secure salaried employment. Further, Self-Employment Programme (SEP) component focuses on financial assistance to individuals/groups/Self Help Groups of urban poor for setting up gainful self-employment ventures or micro-enterprises. District-wise details of physical progress under the scheme are not maintained at the Central level (Ministry of Housing and Urban Affairs, 2013).

To enhance the reach of the programme, the scheme is monitored by a Governing Council chaired by the Hon'ble Minister for Housing and Urban Affairs (MoHUA) and an Executive Committee chaired by the Secretary of MoHUA at Central level. At the state level, it is monitored by a Governing Council (GC) and Executive Committee (EC). At the City/ULB level, the mission is monitored by an Executive Committee chaired by Municipal Commissioner. Further, the Ministry conducts regular seminars, conferences, workshops with the States/ULBs for outreach of the programme. In addition, IEC activities are conducted through awareness campaigns regularly under the Mission (Ministry of Housing and Urban Affairs, 2013).

1.7.3 Prime Minister's Employment Generation Programme (PMEGP)

The Prime Minister's Employment Generation Programme (PMEGP), launched in August 2008, is a flagship credit-linked subsidy scheme administered by the Ministry of Micro, Small and Medium Enterprises (MSME), Government of India. Aimed at addressing the pressing issue of unemployment, PMEGP seeks to generate sustainable employment opportunities by promoting the establishment of micro-enterprises in the non-farm sector across rural and urban areas. The scheme emerged from the merger of two earlier programs—Prime Minister's Rojgar Yojana (PMRY) and Rural Employment Generation Programme (REGP)—consolidating their objectives to create a more robust framework for entrepreneurship development. With an approved outlay of ₹13,554.42 crore for the period 2021-22 to 2025-26, PMEGP targets the establishment of approximately 400,000 micro-enterprises, generating employment for around 30 million individuals at an average of eight jobs per unit (Ministry of Micro, Small and Medium Enterprises, 2008).

The PMEGP is designed with a multi-pronged approach to stimulate economic growth and employment. Its primary objectives include (Ministry of Micro, Small and Medium Enterprises, 2008):

- **Employment Generation:** To create continuous and sustainable employment opportunities for unemployed youth, traditional artisans, and prospective entrepreneurs in both rural and urban areas.
- **Promotion of Micro-Enterprises:** To facilitate the establishment of new self-employment ventures and micro-enterprises in the non-farm sector, thereby fostering entrepreneurship.
- **Financial Inclusion:** To enhance credit flow to the micro-enterprise sector by involving financial institutions and providing margin money subsidies.
- **Support for Traditional Artisans:** To bring together widely dispersed traditional artisans and provide them with self-employment opportunities at their localities, preserving cultural and economic heritage.

The implementation of PMEGP is a collaborative effort involving multiple stakeholders at the national and state levels. The Khadi and Village Industries Commission (KVIC) serves as the nodal agency at the national level, coordinating

the scheme's execution. At the state level, the scheme is implemented through State KVIC Directorates, State Khadi and Village Industries Boards (KVIBs), District Industries Centres (DICs), the Coir Board (for coir-related activities), and banks. The government may also engage other suitable agencies to enhance outreach and efficiency.

1.7.4 Self Employment Scheme for Rehabilitation of Manual Scavengers (SRMS)

The Self Employment Scheme for Rehabilitation of Manual Scavengers (SRMS), launched in January 2017 by India's Ministry of Social Justice and Empowerment, is a transformative program designed to end the degrading practice of manual scavenging and support those affected, along with their families. Grounded in the Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013 (MS Act, 2013), SRMS offers a path to better livelihoods through financial aid and self-employment opportunities. By providing one-time cash payments, capital subsidies, and affordable loans, the scheme tackles a pressing social justice issue, helping manual scavengers and their families move toward dignified, sustainable work (Ministry of Social Justice and Empowerment, 2007).

The Self Employment Scheme for Rehabilitation of Manual Scavengers (SRMS) aims to uplift manual scavengers and their families from socio-economic marginalization by offering practical alternatives to manual scavenging. Its main goals, as outlined by the Ministry of Social Justice and Empowerment (2007), are:

- **Rehabilitation through Alternative Occupations:** To assist identified manual scavengers and their dependents in transitioning to alternative, dignified self-employment ventures.
- **Financial Empowerment:** To provide financial support through one-time cash assistance, capital subsidies, and concessional loans to establish sustainable livelihoods.
- **Social Justice and Dignity:** To eradicate manual scavenging, as mandated by the MS Act, 2013, and restore dignity to affected individuals by integrating them into mainstream economic activities.

- **Support for Sanitation Workers:** To extend assistance to sanitation workers and their dependents for sanitation-related self-employment projects, aligning with broader sanitation goals.

SRMS provides a multi-tiered financial support system to ensure comprehensive rehabilitation (Ministry of Social Justice and Empowerment, 2007):

- **One-Time Cash Assistance:** Identified manual scavengers, one per family, receive ₹40,000 as immediate financial support to meet basic needs and initiate rehabilitation.
- **Capital Subsidy:** A project-based upfront capital subsidy of up to ₹5,00,000 is provided to manual scavengers and their dependents for self-employment ventures. The same subsidy is extended to sanitation workers for sanitation-related projects.
- **Concessional Loans:** Beneficiaries can avail concessional loans to supplement the capital subsidy, enabling them to undertake viable self-employment projects.
- **Training and Skill Development:** Beneficiaries are provided skill development training with a stipend of ₹3,000 per month during the training period to equip them for alternative occupations.

The financial assistance is disbursed through designated channels, with banks and financial institutions involved in providing loans. The National Safai Karamcharis Finance and Development Corporation (NSKFDC) often plays a key role in coordinating credit facilities.

SRMS targets a specific group of beneficiaries to ensure focused rehabilitation. The eligibility criteria include (Ministry of Social Justice and Empowerment, 2007):

- **Manual Scavengers:** Individuals identified as manual scavengers during state government surveys, holding an MS-ID/Receipt Number, and their dependents are eligible. A “manual scavenger” is defined under the MS Act, 2013 as a person engaged in manually cleaning, carrying, or handling human excreta in insanitary latrines, open drains, pits, or railway tracks before decomposition.

- Sanitation Workers: Sanitation workers and their dependents are eligible for assistance specifically for sanitation-related self-employment projects, provided they submit an occupation certificate from a designated authority.
- Exclusions: Only one member per family is eligible for one-time cash assistance, ensuring equitable distribution of benefits. Beneficiaries must not have availed similar benefits under other central or state schemes to avoid duplication.

The scheme prioritizes inclusivity by extending benefits to dependents, recognizing the intergenerational impact of manual scavenging on families.

1.8 Overview of Banking Sector in Mizoram and its Challenges

Mizoram, a small state in Northeast India, is known for its hilly terrain, vibrant culture, and predominantly agrarian economy. The banking sector in Mizoram plays a pivotal role in supporting the state's economic development, facilitating financial inclusion, and enabling access to credit for individuals, businesses, and government initiatives. However, the sector faces unique challenges due to the state's geographical, economic, and socio-cultural characteristics.

The banking sector in Mizoram comprises a mix of public sector banks (PSBs), private sector banks, regional rural banks (RRBs), cooperative banks, and small finance banks. The State Bank of India (SBI) is the lead bank in Mizoram, coordinating banking activities and chairing the State Level Bankers' Committee (SLBC). Mizoram has a network of over 200 bank branches, with a significant presence of PSBs like SBI, Punjab National Bank, Canara Bank, Bank of India, Bank of Baroda, Union Bank of India, Bank of Maharashtra, Indian Overseas Bank, UCO Bank, Punjab and Sind Bank and Central Bank of India, alongside private banks such as HDFC Bank, Axis Bank, ICICI Bank, Kotak Mahindra Bank, IndusInd Bank and Yes Bank. The Mizoram Rural Bank (MRB), a regional rural bank sponsored by SBI, plays a critical role in serving rural and semi-urban areas, focusing on agriculture and micro-enterprises.

Non-Banking Financial Companies (NBFCs) and microfinance institutions also contribute to the financial ecosystem, particularly in areas where traditional

banking penetration is low. The Reserve Bank of India (RBI) regulates the banking sector, ensuring compliance with national standards, while the state government collaborates with banks to align financial services with developmental goals, such as supporting agriculture, allied sectors, and Micro, Small, and Medium Enterprises (MSMEs).

According to the RBI's Report on Trend and Progress of Banking in India 2023-24, the Indian banking sector, including Mizoram, has shown resilience with improved asset quality and profitability. However, specific data for Mizoram highlights unique trends:

Credit-Deposit (CD) Ratio: The CD ratio, a measure of how much of a bank's deposits are lent out as credit, is a critical concern in Mizoram. In January 2025, Mizoram's Chief Minister Lalduhoma noted that some banks had CD ratios as low as 20–40%, indicating that a significant portion of deposits collected in Mizoram is not being reinvested locally (The Times of India, 2025). This contrasts with the national average CD ratio of around 75–80% for scheduled commercial banks (SCBs).

Branch Penetration: As of 2023, Mizoram had approximately 1 bank branch per 5,500 people, better than some Northeastern states but lower than the national average (Economic Survey of Mizoram, 2025). Many parts of rural areas suffer from limited branch presence, with many villages relying on banking correspondents or mobile banking units.

Financial Inclusion: The Pradhan Mantri Jan Dhan Yojana (PMJDY) has significantly boosted account openings, with over 90% of households in Mizoram having at least one bank account by 2023 (RBI, 2024). However, active usage of these accounts particularly in rural areas remains a challenge due to lack of branch penetration.

Asset Quality: The gross non-performing assets (GNPA) ratio for banks in Mizoram aligns with the national trend, declining to around 2.5% in September 2024, reflecting improved loan recovery and credit discipline.

Challenges Mizoram's Banking Sector

India's banking sector has been transformed by rapid digitalization, driven by programs like Digital India and the Unified Payments Interface (UPI), making financial services faster and more accessible. But this shift has also brought a surge in cybersecurity risks. In 2024, India faced a staggering 79 million cyberattacks, with banks being prime targets due to their troves of sensitive customer data and critical systems. Mizoram, a northeastern state with 1.2 million people and a banking sector focused on lending to priority areas like agriculture and small businesses, faces its own set of challenges. Limited internet access, low awareness of digital security, and its location near Myanmar and Bangladesh make it particularly vulnerable. Global events, like the 2021 Myanmar military coup and the ongoing Rohingya refugee crisis in Bangladesh, have worsened these risks, fueling regional instability, cross-border cyberattacks, and economic pressures.

1.8.1 Cybersecurity Threats Facing Mizoram's Banks

Mizoram's banks, including major players like State Bank of India (SBI), Mizoram Rural Bank (MRB), and Mizoram Cooperative Apex Bank (MCAB), serve a mostly tribal population with a strong literacy rate (91.3%) but limited experience with digital technology. As these banks lean on digital tools to deliver loans for farming, small businesses, and programs like DAY-NRLM, they face several cybersecurity threats:

- **Phishing and Social Engineering:** Rural customers, often unfamiliar with digital risks, are easy targets for phishing scams through texts or fake loan apps. A 2023 RBI report highlighted a spike in OTP frauds across Northeast India, with Mizoram's UPI users especially at risk because they often trust unofficial messages.
- **Ransomware and Malware:** Smaller banks with outdated IT systems are sitting ducks for ransomware, like the 2022 attack that crippled AIIMS Delhi's operations. Mizoram's banks, with tight cybersecurity budgets, are particularly exposed.

- **Data Breaches:** The 2024 Star Health data leak on Telegram showed how vulnerable sensitive information is. Mizoram's banks face similar dangers from weak digital defenses.
- **Insider Threats:** Staff with limited training in small organizations can accidentally open the door to attacks by falling for phishing emails or ignoring security protocols. A 2024 PwC India study found that half of Indian companies faced breach costs of \$1–20 million due to such mistakes (PwC, 2023).
- **Cross-Border Cyber Threats:** Mizoram's close border with Myanmar, which accounted for 45% of consumer cyberattacks in 2024, raises the threat of state-backed or criminal attacks, like the DDoS strikes CERT-In reported hitting northern India in 2025.

These threats can throw banking operations into chaos, shake customer confidence, and drive up bad loans (NPAs) through fraud, adding stress to banks' operations and reputations. Mizoram's spotty digital setup—low rural internet access and heavy reliance on mobile networks—makes things worse, as banks struggle to roll out advanced protections like the zero-trust systems required by RBI's 2022 Digital Banking Framework.

1.8.2 International Politics and Their Impact on Mizoram's Banking Sector

The 2021 Myanmar military coup and the Bangladesh Rohingya refugee crisis have created a volatile geopolitical environment that amplifies cybersecurity risks in Mizoram's banking sector. These events, rooted in regional instability, intersect with Mizoram's socio-economic and strategic context, hampering banking resilience in the following ways:

Myanmar Coup and Cross-Border Cyber Threats

The February 2021 military coup in Myanmar, led by General Min Aung Hlaing, toppled the democratic government, triggering widespread conflict and displacement. Mizoram, sharing a 510 km porous border with Myanmar's Chin State, faces heightened cybersecurity risks due to this instability:

- **Cross-Border Cybercrime:** Myanmar's post-coup chaos has made it a hub for cybercriminal networks, with 45% of consumer-targeted cyberattacks in 2024 originating from the region. CERT-In reported DDoS attacks targeting northern India in 2025, potentially exploiting Mizoram's proximity to Myanmar. Small banks with limited cybersecurity expertise, are ill-equipped to counter such threats.
- **Insurgent and Criminal Networks:** Historically, Mizoram's border with Myanmar facilitated insurgent activities, as seen in the 1970s Mizo insurgency supported by bases in Bangladesh's Chittagong Hill Tracts. Post-coup, Myanmar's conflict has revitalized clandestine networks, some of which leverage cyber tools for extortion or fraud. These networks could target Mizoram's banks, particularly those serving cross-border communities, to fund illicit activities.
- **Refugee Influx and Fraud Risks:** Since the coup, over 40,000 Myanmar refugees, primarily from the Chin ethnic group with ties to Mizoram's Mizo population, have entered the state, supported by local NGOs and the Mizoram government despite India's non-signatory status to the 1951 Refugee Convention. This influx strains banking resources, as refugees access informal financial services, increasing risks of identity fraud and money laundering. For instance, unverified accounts opened for humanitarian aid could be exploited for phishing or ransomware.

Bangladesh Refugee Crisis and Regional Instability

The Rohingya refugee crisis, intensified by Myanmar's 2017 ethnic cleansing and post-coup violence, has seen over 1 million Rohingya flee to Bangladesh's Cox's Bazar, with thousands more arriving since 2023. Mizoram, sharing a 318 km border with Bangladesh, is indirectly impacted by this crisis, which fuels cybersecurity and operational risks:

- **Regional Cybercrime Spillover:** Bangladesh's financial sector faces 630 daily cyberattacks, with 52% of banks at high risk due to inadequate security

investments. Cox's Bazar, a hub for drug trafficking post-2017, has seen Rohingya militant groups like the Arakan Rohingya Salvation Army (ARSA) engage in criminal activities, some cyber-enabled. These activities could spill into Mizoram, targeting its banks through phishing or malware campaigns.

- **Refugee-Related Fraud:** Bangladesh's strained refugee camps, hosting 90% of the global Rohingya population, face deteriorating security, with armed groups like ARSA forcibly recruiting refugees. Mizoram's banks, serving cross-border tribal communities, risk exposure to fraudulent transactions or money laundering linked to these groups, especially as refugees seek informal financial access.
- **Geopolitical Tensions:** Bangladesh's 2024 political instability, following a coup allegedly influenced by external powers, has heightened regional tensions. India's security concerns, including fears of Bangladesh promoting anti-India activities alongside Pakistan, increase the likelihood of state-sponsored cyberattacks targeting Northeast India, including Mizoram's banking infrastructure.

1.9 Conclusion

India's banking sector is at a turning point, where smart risk management isn't just about meeting regulatory requirements—it's a must for staying stable, resilient, and poised for lasting growth. This chapter has unpacked the many layers of risk management, from the core ideas of ISO 31000:2018 to the step-by-step process of spotting, analyzing, assessing, and tackling risks. Paired with global benchmarks like the Basel Accords, these tools give banks a strong foundation to handle a range of challenges—credit, market, operational, liquidity, regulatory, and reputational risks—in today's unpredictable financial world. Looking back, the journey of Indian banking, from the post-independence days to today's era of digital transformation and new threats like cyberattacks and climate change, shows how adaptable the sector has become, with risk management growing ever more sophisticated.

In Mizoram, banks face their own unique hurdles, shaped by limited digital infrastructure, a heavy focus on priority sector lending, and the state's closeness to

unstable borders. Cybersecurity risks, worsened by regional tensions from the 2021 Myanmar coup and the Rohingya refugee crisis in Bangladesh, pose serious threats to banks like SBI, Mizoram Rural Bank, and Mizoram Cooperative Apex Bank. These issues call for customized risk management approaches that tackle local weaknesses while staying in sync with national and global standards. Programs like priority sector lending and government initiatives such as DAY-NRLM and PMEGP are key to boosting financial inclusion and economic empowerment, but they bring complexities that need careful oversight. Meanwhile, non-priority lending can be profitable but demands sharp attention to avoid risks from over-reliance on certain borrowers or economic dips.

As banks venture into new territory—shaped by technology, environmental concerns, and global politics—the principles of integration, customization, and constant improvement from ISO 31000 remain essential. For Mizoram, building stronger cyber defences, improving digital access, and managing cross-border risks are vital to keeping the financial system secure and supporting the state’s social and economic goals. By weaving risk management into their core strategies and following RBI’s guidance, Indian banks can not only fend off threats but also seize chances to build customer trust, streamline operations, and ensure long-term success. For the latest updates and guidelines, check RBI circulars (rbi.org.in) and CERT-In advisories (cert-in.org.in).

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CHAPTER-2

LITERATURE REVIEW

A thorough literature review offers profound insights into the existing body of knowledge within a specific field. It is essential to review previous studies conducted in the relevant field. A meticulous examination of previous research conducted in the relevant field is essential for gaining a comprehensive understanding of the topic and pinpointing any gaps in knowledge. This process enables the identification of areas requiring further investigation and improvement.

This literature review examines the risk management practices of various businesses particularly that of financial institutions by giving special emphasis on credit risk. The various aspects of risk management include understanding risk and risk management, availability of resources for risk management, perception of bankers towards risk management, risk identification, risk analysis and monitoring, risk management practices and bankers' perception towards credit risk management practices. The remaining part of this chapter is segmented covering different areas of risk management as listed below:

- 2.1 Credit risks and its determinants
- 2.2 Credit risks and Bank Profitability.
- 2.3 Credit risk management Practices
- 2.4 Risk management practices
- 2.5 Identification of research gap and point of entry for the thesis.

2.1 Credit Risk and its Determinants

The existing body of literature on bank credit risk has examined the relative impact of bank specific and macroeconomic variables in predicting NPA. The role of capital, credit growth, credit deposit ratio, inflation and economic growth among many; arise in this context.

Aunon-Nerin et al. (2002) examine the determinants of credit risk by studying the Credit Default Swap (CDS) transaction data investigating whether fixed income markets information is sufficient for credit risk evaluation. The study

revealed that CDS spreads are influenced significantly by a range of factors including firm specific variables such as leverage, profitability, industry effects and macroeconomic conditions like interest rates and GDP growth. The study suggested that multifaceted framework can provide more accurate risk evaluation.

Jiménez and Saurina (2004) looked at how things like collateral, the type of lender, and close bank-customer relationships affect the risk of loans going bad. They studied a bunch of Spanish bank loans and found that loans backed by collateral are less risky. Also, the strong relationship between banks and borrowers drops the the chance of default. Loans from savings banks and cooperative banks were safer than those from commercial banks. This shows that building trust with borrowers and using collateral wisely can really help keep risks low. Their work gives banks and policymakers solid evidence to improve lending practices and keep the financial system stable.

Das and Ghosh (2007) study dug into what drives credit risk in India's state-owned banks from 1996 to 2004. Using a statistical method, they found that bigger banks with stronger finances and profits tend to have lower credit risk. On the flip side, loans that aren't being paid back (called non-performing assets) and rapid loan growth increase risk. Things like industry trends (e.g., credit growth and interest rates) and the broader economy (like GDP growth and inflation) also play a big role. The takeaway? Banks need smart risk management, strong regulations, and a stable economy to keep credit risk in check. This gives bank managers and regulators clear ideas to strengthen the system.

Ahmad and Ariff (2008) explored what causes credit risk in banks across different countries, looking at the economy, bank operations, and industry factors. They found that things like economic growth, inflation, bank size, financial strength, and the ratio of loans to deposits all affect credit risk. The study showed that what drives risk can vary by region, so banks need customized strategies to manage it. Their findings help policymakers and banks better understand how to handle credit risk in different economic settings, offering practical insights for keeping finances stable.

Jiménez and Saurina (2004) studied how collateral, lender type, and bank-borrower relationships impact loan risks using Spanish bank data. Loans with collateral and those from savings or cooperative banks show lower risk, while strong borrower relationships reduce defaults. The research offers banks and policymakers practical ways to use trust and collateral to manage risk and strengthen the financial system.

Das and Ghosh (2007) explored what drives credit risk in India's state-owned banks from 1996 to 2004 with statistical analysis. Larger banks, strong finances, and profits lower risk, but bad loans, rapid loan growth, and economic factors like credit growth, interest rates, GDP, and inflation increase it. The findings guide banks and regulators to manage risk and maintain a stable banking system.

Ahmad and Ariff (2008) investigated credit risk causes across countries, examining economic, bank, and industry factors. GDP growth, inflation, bank size, financial strength, and loan ratios influence risk, with regional differences. The study helps banks and policymakers customize risk management for different economies, supporting financial stability.

Maltritz and Molchanov (2008) explored country credit risk using a Bayesian approach, factoring in prior knowledge and uncertainty. Economic growth and trade balance reduce risk, while inflation and external debt increase it. The research helps policymakers, investors, and rating agencies assess country creditworthiness with a fresh perspective on managing uncertainty.

Ali and Daly (2010) studied how economic factors like GDP growth, inflation, interest rates, and exchange rates affect credit risk across countries. Economic instability raises risk, but effective monetary policies help control it. The findings offer policymakers and banks practical ideas to manage risk and ensure financial stability in diverse economies.

Thiagarajan (2011) analyzed credit risk in Indian commercial banks from 2001 to 2010, using data from 22 public and 15 private banks. Past bad loans strongly predict future ones, and a strong economy lowers risk for both bank types. The study shows how bank and economic factors drive risk, offering banks and regulators clear strategies to manage it.

Mileris (2012) examined how economic factors like GDP growth, inflation, unemployment, and interest rates affect credit risk in bank loan portfolios. Tough economic times increase risk, but smart monetary policies help reduce it. The research gives bankers and policymakers practical insights to manage risk and keep the financial system stable.

Castro (2013) focused on credit risk in the banking systems of Greece, Ireland, Portugal, Spain, and Italy during tough times. Weak economies and high public debt increase risk, with each country facing unique challenges like debt crises. The findings help banks and policymakers manage risk and avoid bigger financial problems in these vulnerable economies.

Ganic (2014) explored credit risk in Bosnia and Herzegovina's banks, focusing on financial strength, asset quality, liquidity, and profitability. Strong banking practices and good capitalization lower risk. The research offers regulators and banks practical advice to strengthen the financial system in Bosnia.

Maltritz and Molchanov (2014) studied country credit risk, considering economic, political, and structural factors with a Bayesian approach. Economic growth, low inflation, political stability, and strong institutions reduce risk, while high debt increases it. The work helps policymakers, investors, and rating agencies assess country creditworthiness by considering multiple factors.

Nikolaidou and Vogiazas (2014) examined credit risk in Bulgaria's banking system, looking at economic conditions, bank operations, and regulations. A stable economy, larger banks, strong finances, and good regulations lower risk. The research gives policymakers and banks in emerging markets like Bulgaria ideas to manage risk and strengthen the financial system.

Roy (2014) used statistical analysis to study bad loans in Indian banks. Bank size, loan growth, and economic instability increase bad loans, while strong finances and economic growth reduce them. The study offers a banks and regulators strategy to tackle bad loans and improve India's banking system stability.

Abdul Manab et al. (2015) explored credit risk in Malaysian banks from 2008 to 2012. Bank size, financial strength, loan ratios, economic growth, inflation, and interest rates all affect risk. The findings give banks and regulators insights to

manage risk and keep Malaysia's financial system stable, especially in emerging markets.

Asamoah and Adjare (2015) studied credit risk in Ghana's commercial banks, examining bank operations, economic conditions, and management practices. Strong finances, good asset quality, and economic growth lower risk, while inflation and interest rate swings increase it. The research offers banks and regulators tips to manage risk and keep Ghana's banking system steady.

Chaibi and Ftiti (2015) investigated credit risk across countries, analyzing economic conditions, bank operations, and regulations. Economic stability, good regulations, and strong banking practices reduce risk. The study helps policymakers and banks manage risk in different economies, offering ideas for a sustainable financial system.

Dhar and Bakshi (2015) examined loan losses in India's public sector banks over five years. Loan ratios, unsecured loans, and financial strength affect bad loans, with some reducing risk. The work gives banks and regulators clear ideas to manage loan losses and strengthen India's banking system.

Kumar and Singh (2015) explored how corporate governance affects Indian bank performance from 2005 to 2012. Board size, makeup, leadership structure, and a good regulatory environment matter. The findings guide banks and regulators to improve governance and strengthen banking system of India.

Waemustafa and Sukri (2015) compared credit risk in Islamic and conventional banks, looking at bank operations and economic conditions. Strong finances, good asset quality, and a stable economy lower risk, with Islamic banks showing more resilience to economic shocks. The work offers banks and regulators insights to keep both bank types stable.

Sahoo and Mohapatra (2016) studied bad loans in Indian commercial banks using advanced statistical methods. Loan growth, financial strength, and economic conditions like GDP and inflation drive risk. The findings help banks and regulators reduce bad loans and keep India's banking system strong.

Chodnicka-Jaworska and Jaworski (2017) examined credit default risk in European and American banks, using statistical analysis. Strong finances, good asset

quality, and a stable economy lower risk, while regulatory differences between regions affect risk levels. The work helps banks and regulators manage credit risk and maintain financial stability.

Gila-Gourgoura and Nikolaidou (2017) explored credit risk in Spain's banking system after the European financial crisis, using statistical methods. Strong bank finances and a stable economy reduce risk, while company-specific weaknesses increase it. The research offers banks and policymakers ideas to manage risk in Spain and similar European economies.

Jović (2017) investigated credit risk in Serbia's banking sector, analyzing economic factors like GDP growth, inflation, and unemployment, plus bank and borrower details. A stable economy and careful banking practices lower risk. The study provides regulators and banks in Serbia with insights to manage risk and strengthen the financial system.

Memdani (2017) examined bad loans in India's banking sector from 2005 to 2014 with statistical models. Economic factors like per capita GDP and inflation strongly affect bad loans in public banks, while bank size and loan ratios matter for private banks. The research helps banks and regulators reduce risk and stabilize India's banking system.

Stolbov (2017) studied Russia's sovereign credit risk, using a statistical model to explore economic factors like GDP growth, inflation, and fiscal balance, plus external factors like oil prices and global conditions. Strong economic growth and favorable global conditions lower risk, while corruption and instability increase it. The work gives policymakers and investors insights to assess Russia's creditworthiness.

Kadanda and Raj (2018) explored bad loans in India's public sector banks from 2009 to 2017, using advanced statistical methods. Past bad loans predict future ones, strong bank finances reduce risk, and economic growth lowers bad loans, though earlier economic conditions can increase them. The study helps banks and regulators reduce bad loans and strengthen India's banking system.

Mpofu and Nikolaidou (2018) investigated credit risk in Sub-Saharan Africa's banking system, analyzing economic, bank, and institutional factors. GDP

growth, inflation, bank size, financial strength, and regulatory quality affect risk, with regional issues like political instability playing a role. The research guides policymakers and banks to manage risk and promote financial stability in the region.

Noomen and Abbas (2018) examined credit risk in Islamic microfinance institutions, focusing on institutional traits, financial performance, and Shariah compliance. Strong governance, profitability, and Shariah compliance reduce risk, while size and age have mixed effects. The research offers policymakers and industry stakeholders insights to improve financial inclusion and stability in Islamic microfinance.

Shahzad et al. (2018) studied credit risk in US industries using panel data analysis. High financial leverage, low liquidity, and poor profitability increase risk, while favorable economic conditions and industry stability reduce it. The research helps investors, policymakers, and banks manage credit risk in US industries.

Vivel-Búa et al. (2018) examined credit risk in micro, small, and medium-sized hotels, using statistical analysis. Smaller firms, poor financial performance, and bad economic conditions increase risk, while high occupancy rates and good risk management reduce it. The research offers banks, hotel managers, and policymakers insights to manage risk in the hospitality sector.

Bardhan et al. (2019) analyzed bad loans in Indian banking, using panel data to find links with bank size, financial strength, loan ratios, and provisioning. Certain levels of these factors significantly increase bad loans. The study helps banks and regulators set optimal levels to reduce bad loans and strengthen India's banking system.

Jayaraman et al. (2019) investigated bad loans in India's commercial banks using panel data analysis. Loan growth, financial strength, provisioning, and economic factors like GDP, inflation, and interest rates drive bad loans. The study offers banks and regulators strategies to reduce bad loans and improve financial stability in India.

Kharabsheh (2019) examined credit risk in Jordanian commercial banks, focusing on bank and economic factors. Financial strength, asset quality, liquidity, profitability, GDP growth, inflation, and unemployment affect risk, as do bank size

and loan concentration. The research highlights the need for strong risk management and economic stability in Jordan's banking sector.

Messai and Gallali (2019) studied credit risk in Europe using a statistical approach. Economic downturns, high inflation, and interest rate swings increase risk, while GDP growth reduces it. The research helps policymakers and banks understand how economic conditions affect credit risk and improve financial stability in Europe.

Ramesh (2019) analyzed bad loans in Indian public sector banks using panel data. Credit growth, financial strength, provisioning, and economic factors like GDP and inflation drive bad loans. The study offers banks and regulators strategies to reduce bad loans and improve India's public sector banking performance.

Rizvi et al. (2019) developed a model to examine bad loans in banks, using advanced analysis to identify key factors like economic, regulatory, and bank-specific variables. The model shows how these factors interact and helps banks and regulators create targeted strategies to reduce bad loans and strengthen financial stability.

Syamlan and Jannah (2019) examined credit risk in Indonesian Islamic commercial banks, focusing on bank, economic, and Shariah compliance factors. Financial strength, asset quality, and Shariah compliance reduce risk, while inflation increases it. The research highlights the need for strong banking practices and Islamic principles to manage risk in Indonesia's Islamic banks.

Misman and Bhatti (2020) investigated credit risk in ASEAN and GCC Islamic banks, analyzing bank, economic, and institutional factors. Financial strength, asset quality, management efficiency, GDP growth, inflation, and regulations affect risk, with regional differences. The study helps policymakers and banks tailor risk management strategies for Islamic banking.

Goswami (2021) studied credit risk persistence in Indian banks from 1998 to 2017, using advanced statistical methods. Past defaults predict future ones, higher profits reduce future bad loans, and larger banks tend to have more bad loans. The research shows how bank concentration, economic growth, and inflation affect risk, offering banks and regulators insights to manage it.

Priyadi et al. (2021) examined credit risk in Indonesian Shariah rural banks, analyzing bank and economic factors. Financial strength, asset quality, management efficiency, and GDP growth reduce risk, while inflation increases it. The findings guide policymakers and banks to promote sustainable Islamic banking in Indonesia's rural areas.

Raiter (2021) investigated credit risk in commercial banks, exploring economic and bank factors. GDP growth, inflation, interest rates, financial strength, asset quality, and liquidity affect risk, with strong banks and stable economies reducing it. The research offers banks and regulators insights to improve risk management and financial stability.

Selvam and Premnath (2021) studied bankers' views on credit risk in Indian commercial banks. Bad loans often come from agricultural and trade loans, driven by poor loan terms, weak lending practices, and inadequate risk management. Economic factors like inflation and exchange rates also play a role. The research helps banks improve credit risk management.

Woo et al. (2021) examined credit risk in logistics and shipping industries using panel data. Liquidity, profitability, leverage, cash flow, freight rates, and fleet size affect risk. Higher liquidity and profitability reduce risk, while freight rate swings increase it. The research helps banks, investors, and industry stakeholders manage risk in these sectors.

Abusharbeh (2022) studied credit risk in Palestine using panel data. Financial strength, asset quality, profitability, GDP growth, inflation, unemployment, and institutional factors like regulations affect risk. Strong banks and good regulations reduce risk, while economic instability increases it. The research offers insights for managing risk in emerging markets like Palestine.

Calderon-Contreras et al. (2022) investigated credit risk in Peruvian municipal savings banks using statistical analysis. Larger banks with strong finances, good asset quality, and profitability have lower risk, while high inflation increases it. The research helps banks and regulators manage risk in Peru's emerging market banking sector.

Carvalho et al. (2022) examined credit risk in the Eurozone, focusing on economic factors. GDP growth reduces risk, while unemployment increases it, and inflation has mixed effects. The study helps policymakers and banks understand economic impacts on credit risk and develop strategies for financial stability in the Eurozone.

Kabir et al. (2022) compared credit risk in Islamic and conventional banks in Bangladesh using panel data. Financial strength, asset quality, liquidity, GDP growth, inflation, and loan structures affect risk, with Islamic banks facing higher risk due to Shariah rules and conventional banks more sensitive to economic swings. The research helps banks and regulators improve risk management in Bangladesh's dual banking system.

Kanapickienė et al. (2022) examined credit risk in consumer credit markets in Central and Eastern Europe using panel data. Economic growth and low inflation reduce risk, while high unemployment, interest rate swings, and exchange rate changes increase it. The research helps policymakers and banks manage risk in these markets.

Naili and Lahrichi (2022) studied credit risk in emerging markets, distinguishing between economic, financial, and bank factors. GDP growth, inflation, interest rates, stock market performance, financial strength, and regulations affect risk, as do industry competition and governance. The findings help banks and regulators manage risk in emerging markets.

Bhatt et al. (2023) examined credit risk management in Nepalese commercial banks. Financial strength, asset quality, liquidity, loan diversification, and economic conditions like GDP and inflation affect risk and bank performance. Strong risk management improves profitability and efficiency. The research helps banks and regulators strengthen Nepal's banking system.

Muhammed et al. (2023) investigated credit risk in Ethiopian commercial banks from 2015 to 2020 using panel data. Bank size, financial strength, loan ratios, GDP growth, and inflation affect risk. The study helps banks and regulators develop strategies to manage risk and improve Ethiopia's banking system.

Nugrahaeni and Muharam (2023) studied credit risk in Indonesian commercial banks, focusing on green credit and other factors. Green credit practices, strong finances, liquidity, and stable economic conditions reduce risk, while poor performance and economic instability increase it. The research highlights how environmental considerations can lower risk and support sustainable banking in Indonesia.

Ayele (2024) investigated credit risk in Ethiopian private commercial banks, using financial statements and survey data. Financial strength, liquidity, asset quality, GDP growth, inflation, exchange rates, and governance affect risk. Strong banks and good risk management reduce risk, while economic instability and weak governance increase it. The research helps banks and regulators improve Ethiopia's banking system.

Shaheen et al. (2024) examined credit risk in Islamic banks in Pakistan using panel data. Financial strength, asset quality, liquidity, GDP growth, inflation, interest rates, and Shariah compliance affect risk. Strong banks and Shariah compliance reduce risk, while economic instability and poor liquidity increase it. The research offers insights for managing risk in Pakistan's Islamic banking sector.

2.2 Credit Risk and Bank Profitability

The significance of bank profitability in the economy is evident through its impact at both micro and macro levels, with profit serving as a critical determinant for competitive banking institutions striving to sustain themselves amidst escalating market competition, while at the macro level, a profitable banking sector is indispensable for absorbing external shocks and ensuring the stability of the financial system (Al-Homaidi et.al 2018). Profitability measures the efficiency and effectiveness of an entity in utilizing its resources for generating income.

Hartarska (2005) studied how governance affects financial performance in microfinance institutions, using data from 245 institutions across 73 countries. Strong governance, like independent boards, female directors, and experienced management, boosts profits and self-sufficiency. Government regulation and

institutional ownership also improve results, offering useful tips for microfinance leaders and policymakers.

Hosna et al. (2009) looked at how credit risk management impacts profits in Swedish commercial banks from 2004 to 2008. Good credit checks and monitoring, plus strong financial reserves, lead to higher profits. The findings suggest Swedish banks can make more money by focusing on solid risk management strategies.

Kithinji (2010) explored how credit risk management affects profits in Kenyan commercial banks from 2000 to 2008. Lower credit risk through careful loan checks, monitoring, and diversification increases profits. The study shows Kenyan banks can improve earnings by strengthening risk management practices.

Muthee (2010) examined credit risk management and profits in Kenyan commercial banks. Effective loan checks, monitoring, and diversification reduce risk and boost profits. The research recommends Kenyan banks focus on risk management to make more money.

Aduda and Gitonga (2011) studied how credit risk management impacts profits in Kenyan commercial banks from 2005 to 2009. Strong loan checks, monitoring, and diversification lead to higher profits. The findings help Kenyan banks improve earnings through better risk management.

Tefera (2011) looked at credit risk management and profits in Ethiopian commercial banks. Careful loan checks, monitoring, and risk reduction strategies increase profits, while bad loans and reserves hurt earnings. The study suggests Ethiopian banks strengthen risk management to boost financial performance.

Afriyie and Akotey (2012) explored credit risk management and profits in Ghanaian rural banks from 2006 to 2010. Good loan checks, monitoring, and diversification reduce risk and increase profits. The research offers rural banks practical ways to improve earnings through risk management.

Boahene et al. (2012) studied credit risk and profits in Ghanaian banks. High credit risk, like bad loans and reserves, lowers profits, while strong financial reserves help. The findings show Ghanaian banks can boost earnings by focusing on effective risk management.

Afriyie and Akotey (2013) explored how credit risk management affects profits in rural banks in Ghana's Brong Ahafo region. Strong loan checks, monitoring, diversification, and collateral management boost profits, while bad loans and reserves hurt earnings. The study suggests rural banks focus on risk management to improve financial performance in unique rural settings.

Berríos (2013) examined how credit risk, profitability, and liquidity relate in commercial banks from 2000 to 2009. High credit risk lowers profits, while good liquidity boosts them. Strong financial reserves and loan diversification also reduce risk, helping banks improve earnings through better risk and liquidity management.

Abusharbeh (2014) studied credit risk and profits in Indonesian Islamic banks. Bad loans, reserves, and risk exposure lower profits, but strong risk management through loan checks and monitoring helps. The research offers Islamic banks ways to boost earnings while staying Shariah-compliant.

Alalade et al. (2014) looked at credit risk management and profits in banks in Lagos, Nigeria. Good loan checks, monitoring, and diversification increase profits, while bad loans and reserves hurt earnings. The study suggests Nigerian banks focus on risk management to make more money.

Kurawa and Garba (2014) examined how credit risk management affects profits in Nigerian banks. Strong loan checks, monitoring, and proactive risk management boost profits, while bad loans and reserves reduce them. The findings help Nigerian banks improve earnings through better risk management practices.

Zou and Li (2014) studied how credit risk management impacts profits in European commercial banks. Strong loan checks, monitoring, and diversification increase profits, while bad loans and reserves hurt earnings. Bank size, financial strength, and liquidity also play a role, offering banks ways to boost financial performance.

Singh (2015) examined how credit risk management affects profits in Indian public and private banks from 2002 to 2013. Strong financial reserves boost profits, but bad loans hurt them, especially in public banks. The study helps Indian banks improve earnings by managing risk better.

Buchory (2015a) looked at how banking operations, efficiency, and credit risk affect profits. Good operations and efficiency boost profits, while high credit risk lowers them. The findings suggest banks can make more money by improving operations and managing risk.

Buchory (2015b) studied how credit risk and operational efficiency impact bank profits across 50 commercial banks. High credit risk and poor efficiency lower profits, but good risk management and cost-cutting help. The research offers banks ways to boost earnings through better risk and efficiency strategies.

Gizaw et al. (2015) examined how credit risk affects profits in Ethiopian commercial banks from 2006 to 2012. Bad loans and reserves lower profits, but good loan monitoring and diversification help. The study suggests Ethiopian banks focus on risk management to improve earnings.

Noman et al. (2015) studied how credit risk impacts profits in Bangladeshi banks from 2003 to 2013. Bad loans and reserves significantly reduce profits, while strong financial reserves help. The findings show Bangladeshi banks can improve earnings by managing credit risk better.

Ebenezer and Omar (2016) looked at how credit risk affects profits in Nigerian commercial banks. Bad loans and reserves lower profits, but good loan checks and monitoring help. The research offers Nigerian banks ways to boost earnings and maintain financial stability.

Fahrul and Rusliati (2016) examined how credit, market, and operational risks affect profits in Indonesian banks. These risks lower profits, while liquidity risk has little impact. Strong loan checks, diversification, and efficiency help banks make more money and stay stable.

Muhamet and Arbana (2016) studied how credit risk management impacts profits in Kosovar banks. Strong loan checks, monitoring, diversification, and collateral management boost profits, while bad loans and reserves hurt earnings. The findings help Kosovar banks improve financial performance through better risk management.

Kutum (2017) looked at how credit risk affects profits in banks listed on the Palestine Exchange. Bad loans and reserves lower profits, but good loan checks and

monitoring help. The research offers Palestinian banks ways to boost earnings and improve financial stability.

Mendoza and Rivera (2017) examined how credit risk and financial reserves affect profits in Philippine rural banks. Bad loans and reserves lower profits, while strong reserves boost them. The study suggests rural banks manage risk and maintain reserves to improve earnings.

Imani and Pracoyo (2018) studied how capital, credit risk, and liquidity risk affect bank profits. Strong financial reserves boost profits, while credit and liquidity risks lower them. The findings help banks balance risk management and capital to improve earnings and stability.

Poudel (2018) looked at how credit risk impacts profits in Nepalese commercial banks. Bad loans, reserves, and risk exposure lower profits, while strong reserves and asset quality help. The study suggests Nepalese banks focus on risk management to boost financial performance.

Abbas et al. (2019) examined how capital, liquidity, and credit risk affect profits in US and Asian banks from 2010 to 2016. Strong capital and liquidity boost profits, while credit risk lowers them, with regional differences. The research helps banks tailor risk management to improve earnings.

Ali and Dhiman (2019) studied how credit risk management affects profits in Indian public sector banks. Strong loan checks, monitoring, and diversification boost profits, while bad loans and reserves hurt earnings. The findings help Indian banks improve financial performance through better risk management.

Mei et al. (2019) looked at how credit risk affects profits in Ghanaian commercial banks. Bad loans, reserves, and risk exposure lower profits, while strong reserves and asset quality help. The study suggests Ghanaian banks focus on risk management to boost earnings.

Sofyan (2019) studied how financial factors affect profits in Indonesian rural banks from 2006 to 2019. Strong reserves and loan ratios boost profits, while high operating costs hurt them. Bad loans have little impact due to strong reserves, helping banks improve earnings.

Cheng et al. (2020) examined how credit, operational, and liquidity risks affect profits in South African commercial banks. Credit and operational risks lower profits, while liquidity risk has little impact. The study suggests South African banks focus on risk management to boost earnings.

De Leon (2020) looked at how credit risk and economic factors affect profits in ASEAN banks. Bad loans, reserves, and economic swings like inflation lower profits, while strong growth helps. The study suggests ASEAN banks manage risk and plan for economic changes to improve earnings.

Gupta and Sikarwar (2020) developed a model to study how credit risk management affects bank profits. Strong loan checks, monitoring, and diversification boost profits, while high risk lowers them. The findings help banks improve earnings through better risk management.

Bandara et al. (2021) examined how credit risk affects profits in Sri Lankan banks. Bad loans, reserves, and risk exposure lower profits, while strong reserves and asset quality help. The study suggests Sri Lankan banks focus on risk management to improve financial performance.

Ngurah and Panji (2021) studied how credit risk, capital, and profits relate in banks. High credit risk lowers profits, but strong reserves help reduce the impact. The findings suggest banks maintain strong reserves and manage risk to boost earnings and stability.

Rasa (2021) looked at how credit risk affects profits in Afghan commercial banks. Bad loans, reserves, and risk exposure lower profits, but good risk management helps. The study suggests Afghan banks focus on loan checks and monitoring to improve earnings.

Sondakh et al. (2021) examined how credit, market, and operational risks affect bank profits. These risks lower profits, while third-party funds boost them. The study suggests banks manage risks and funds strategically to improve financial performance.

Abdelaziz et al. (2022) studied how credit and liquidity risks affect profits in MENA region banks. Credit risk lowers profits, and liquidity risk makes it worse, but

good liquidity management helps. The findings offer banks ways to manage risks and improve earnings.

Fauziah and Fadhilah (2022) looked at how credit risk affects bank profits, considering bank traits. High credit risk lowers profits, but strong reserves, asset quality, and bank size help. The study suggests banks manage risk and leverage these factors to boost earnings.

Sang Tang My (2022) studied how credit risk, profits, and financial stability relate in banks. High credit risk hurts profits and stability, but strong profits help. The findings suggest banks manage credit risk to improve earnings and maintain stability.

Iqbal et al. (2023) examined how Islamic partnership financing, credit risk, and profits relate in Pakistan's Islamic banks. This financing boosts profits, while credit risk lowers them. The study suggests Islamic banks manage risk to improve financial performance.

Yusditasari et al. (2023) looked at how credit risk, management risk, and capital affect profits in Indonesian banks. Credit and management risks lower profits, while strong reserves help. The study suggests Indonesian banks focus on risk management and capital to boost earnings.

Ahmed et al. (2024) studied how credit risk management affects profits in Pakistani private banks from 2017 to 2022. Strong loan checks, monitoring, diversification, and collateral management boost profits, while bad loans and reserves hurt them. The findings help Pakistani banks improve earnings through better risk management.

Fombang and Maseko (2024) examined how credit risk affects profits in South African banks. Bad loans, reserves, and risk exposure lower profits, but good risk management helps. The study suggests South African banks focus on loan checks and monitoring to improve earnings.

Maseko and Fombang (2024) looked at how credit risk impacts profits in South African banks. Bad loans, reserves, and risk exposure lower profits, but strong risk management helps. The findings suggest South African banks prioritize risk management to boost financial performance and stability.

2.3 Credit Risk Management Practices

Fatemi and Fooladi (2006) explored how financial institutions manage credit risk through a survey. Diversifying loans, using credit scoring, monitoring borrowers, and managing collateral help reduce risk and improve financial performance. The research offers banks practical ways to strengthen risk management and avoid losses.

Ngare (2008) surveyed credit risk management in Kenyan commercial banks. Larger banks use stronger loan checks, monitoring, but smaller ones struggle with poor risk assessment and limited tools. The findings show Kenyan banks need better credit information and advanced methods to manage risk effectively.

Dam (2010) evaluated credit risk management in a Vietnamese bank's transaction office. Strong loan checks and monitoring work well, but weak credit information and high loan concentration increase risk. The study suggests improving information systems and diversifying loans to boost financial stability.

Gaitho (2010) surveyed credit risk management in Nairobi's Savings and Credit Cooperatives (SACCOs). Many SACCOs lack strong risk assessment and monitoring, influenced by size and governance. The research offers SACCO managers and regulators ideas to improve risk management and financial health.

Gisemba (2010) examined how credit risk management affects Kenyan SACCOs' financial performance. Strong loan checks, monitoring, and collateral management boost profits and reduce bad loans. The study helps SACCO leaders and policymakers strengthen cooperative banking in Kenya.

Onyango (2010) surveyed credit risk management in Kenyan commercial banks. Practices vary, with bank size and regulations affecting loan checks and monitoring. The findings suggest banks improve risk assessment to enhance financial stability.

Rahman (2011) reviewed credit risk management in banks, focusing on loan checks, monitoring, and Islamic banking methods. These practices reduce risk and ensure stability, offering banks and policymakers useful strategies, especially for Shariah-compliant systems.

Korir (2012) studied how credit risk management impacts Kenyan microfinance institutions' financial performance. Strong loan checks, monitoring, and collateral management improve profits and reduce bad loans, influenced by size and regulations. The research guides microfinance leaders to manage risk better.

Lagat et al. (2013) examined how credit risk management affects Kenyan SACCOs' lending portfolios. Strong loan checks, monitoring, and collateral management reduce bad loans and improve loan recovery, driven by training and regulations. The study helps SACCOs enhance financial stability.

Brown et al. (2014) explained credit risk management basics, including assessing borrowers, structuring loans, and monitoring. These practices reduce bad loans and boost financial performance, offering banks and policymakers a clear guide to manage risk effectively.

Asfaw et al. (2015) studied credit risk management in Ethiopian commercial banks. Strong loan checks, monitoring, and collateral management reduce bad loans and increase profits, influenced by training and regulations. The findings help Ethiopian banks improve financial stability.

Lalon (2015) explored credit risk management in a Bangladeshi commercial bank. Weak risk assessment and limited tools lead to bad loans, but better loan checks and information systems can help. The study offers Bangladeshi banks ways to strengthen risk management.

Naresh and Rao (2015) examined credit risk management in Indian commercial banks. Loan checks, monitoring, and diversification reduce bad loans and boost performance, but practices vary. The research helps Indian banks and policymakers manage risk better.

Sabeza et al. (2015) evaluated credit risk management in Rwandan commercial banks. Strong loan checks, monitoring, and collateral management improve profits and reduce bad loans, driven by training and regulations. The study offers Rwandan banks ways to enhance financial stability.

Tanui et al. (2015) studied credit risk management in Kenyan SACCOs in Nakuru East. Strong loan checks, monitoring, and collateral management boost

financial performance, influenced by training and regulations. The findings help SACCOs improve stability and profits.

Adjirackor et al. (2016) evaluated credit risk management in Societe General Ghana. Strong loan checks work well, but weak credit information and high loan concentration pose risks. The study suggests Ghanaian banks diversify loans and improve information to reduce risk.

Apanga et al. (2016) examined credit risk management in Ghanaian listed banks. Strong loan checks and monitoring reduce bad loans and boost profits, influenced by bank size and regulations. The research helps Ghanaian banks improve financial performance.

Koulafetis (2017) provided a detailed guide on modern credit risk management, covering scoring models, portfolio management, and regulations like Basel Accords. Real-world examples show how to manage risk across financial sectors, helping banks and policymakers strengthen practices.

Wachira (2017) studied how credit risk management affects loan performance in Kenyan banks in Nyeri County. Strong loan checks, monitoring, and collateral management reduce bad loans, driven by bank size and regulations. The findings help Kenyan banks improve loan quality.

Witzany and Witzany (2017) explained credit risk management basics, including scoring models, loan checks, and advanced tools like credit derivatives. These practices ensure financial stability, offering banks and professionals a clear guide to manage risk.

Muigai et al. (2018) investigated credit risk management in Kenyan commercial banks. Strong loan checks, monitoring, and collateral management boost financial performance and reduce bad loans. The study offers banks and policymakers ways to enhance stability in Kenya.

Odonkor (2018) assessed credit risk management at Adansi Rural Bank in Ghana. Strong loan checks, monitoring, and collateral management reduce bad loans and improve performance. The research helps Ghanaian rural banks manage risk effectively.

Bülbül et al. (2019) explored what drives credit risk management in banks. Bank size, financial reserves, economic conditions, and regulations shape practices like collateral and diversification. The study helps banks and policymakers tailor risk management strategies.

Paul et al. (2020) studied credit risk management in Nairobi's microfinance institutions. Strong loan checks, monitoring, and collateral management improve profits and reduce bad loans. The findings help microfinance leaders manage risk and boost financial health.

Bouteille and Coogan-Pushner (2021) provided a detailed handbook on credit risk management, covering scoring models, collateral, and stress testing. These practices help manage risk across financial sectors, offering banks and professionals a comprehensive guide.

Brahmaiah (2022) examined credit risk management in Indian banks. Strong loan checks, monitoring, and collateral management reduce bad loans, influenced by bank size and regulations. The study helps Indian banks manage risk and improve stability.

Iqbal and Fikri (2023) compared credit risk management in Pakistan's Islamic and public commercial banks. Islamic banks use stronger risk checks due to Shariah rules, reducing bad loans more effectively. The findings help Pakistani banks and regulators improve risk management.

Qureshi and Lamarque (2023) studied risk management in major European banks. Strong risk frameworks, controls, and reporting reduce credit risk, driven by governance and regulations. The research helps European banks enhance stability and manage risk effectively.

2.4 Risk Management Practices

Selltiz et al. (1976) offer a guide for social science research, including methods useful for banking risk studies. Systematic surveys and experiments help understand risk perception and management, providing tools to design strong research on how banks handle risks.

Weber and Milliman (1997) study how perceived risk shapes risk-taking, relevant to banking. Experimental data show risk perception affects decisions, often leading to inconsistent choices due to biases. The findings suggest bankers need tools to align perceptions with objective analysis for better risk management.

Fatemi and Glaum (2000) explore risk management in German firms. Larger, global firms use advanced tools like derivatives to manage currency, interest rate, and commodity risks. The study highlights tailored policies and monitoring to reduce risk, offering firms ideas to strengthen financial strategies.

Venkatesh and Davis (2000) expand the Technology Acceptance Model, showing usefulness and ease of use drive technology adoption. In banking, this applies to risk management tools like credit scoring software, helping banks overcome resistance to tech solutions.

Loewenstein et al. (2001) introduce the "risk as feelings" idea, where emotions like fear or overconfidence shape risk decisions in banking. Experimental evidence shows these emotions can lead to biased choices, suggesting banks need emotion-aware risk frameworks.

Shefrin (2001) applies behavioral finance to risk management. Cognitive biases like overconfidence lead bankers to misjudge risks, but awareness and behavioral insights can improve risk frameworks, blending psychology with quantitative models for better banking decisions.

Al-Tamimi (2002) analyzes risk management in UAE commercial banks. Banks focus on credit, liquidity, and operational risks, but less on market risks, influenced by size and regulations. The study suggests stronger frameworks and controls to boost financial stability.

Raghavan (2003) explains risk management's role in banking stability. Managing credit, market, and liquidity risks with strong identification, monitoring, and controls reduce losses. The research offers banks and regulators ways to build resilient risk cultures.

Adeleye et al. (2004) study risk management in Nigerian banks' IT outsourcing. Data security and vendor issues pose risks, but strong assessments,

contracts, and audits help. The findings guide Nigerian banks to manage outsourcing risks effectively.

Al-Tamimi and Al-Mazrooei (2007) compare risk management in UAE national and foreign banks. Foreign banks use advanced tools like stress testing, while national banks lag, influenced by culture and regulations. The study suggests aligning with global standards for better risk management.

Jorion (2007) explains Value at Risk (VaR) for managing market risk in banks. VaR measures potential losses but misses' extreme events, so banks need extra tools. The work helps banks integrate VaR into risk frameworks for stability.

Hassan (2009) examines risk management in Brunei's Islamic banks. Credit, operational, and liquidity risks are the key, managed with Shariah compliance and controls. The study offers Islamic banks ways to tailor risk strategies for stability.

Rosman (2009) develops a risk management framework for Islamic banks. Managing credit, market, and Shariah risks with strong governance and monitoring ensures stability. The research guides Islamic banks to balance compliance and risk effectively.

Acharya and Richardson (2010) study systemic risk in global banking post-2008 crisis. Interconnected banks amplify risks through leverage and hidden activities, needing broader regulation. The findings push banks toward system-wide risk management.

Aven (2010) proposes a framework for handling uncertainty in risk management. Separating randomness and knowledge gaps helps banks manage unpredictable risks with tools like sensitivity analysis, improving decision-making.

Weber (2010) explores how risk attitudes vary by context, affecting banking decisions. Financial risk aversion differs from other domains, helping banks predict and manage subjective risk assessments.

Bessis (2011) covers banking risk management, addressing credit, market, and liquidity risks. Enterprise-wide frameworks, governance, and regulations like Basel III reduce losses, offering banks a guide to navigate risk complexities.

Wang and Rasheed (2011) study risk management in Pakistani Islamic banks. Credit and operational risks are managed with profit-sharing models, but limited

resources hinder advanced tools. The findings help Islamic banks tailor risk strategies.

Abu Hussain and Al-Ajmi (2012) compare risk management in Bahrain's conventional and Islamic banks. Islamic banks prioritize Shariah compliance, while conventional banks focus on regulations, needing tailored frameworks for stability.

Allen and Saunders (2012) review banking risk management post-2008. Overreliance on models like VaR missed extreme risks, so stress testing and Basel III reforms help. The study pushes banks for adaptive risk strategies.

Bangladesh Bank (2012) provides risk management guidelines for banks. Integrated frameworks for credit, market, and liquidity risks with strong oversight and controls boost stability, offering banks a regulatory roadmap.

Khalid and Amjad (2012) examine risk management in Pakistan's Islamic banks. Credit, operational, and liquidity risks dominate, needing better controls and Shariah compliance. The study helps Islamic banks strengthen risk practices.

Ben Selma et al. (2013) study risk management in Tunisian commercial banks. Traditional tools focus on credit risk, but weak training and regulations limit progress. The findings suggest advanced tools and oversight for stability.

Kumah and Sare (2013) explore risk management in Ghanaian commercial banks. Credit, liquidity, and operational risks are key, managed with assessments and collateral, but monitoring lags. The study helps Ghanaian banks improve risk practices.

Rahman et al. (2013) analyze risk disclosure in MENA Islamic banks. Credit and operational risks are reported, but transparency varies due to regulations. The findings push Islamic banks for clearer disclosures to boost trust.

Raza Bilal et al. (2013) compare risk management in sub-continent and Gulf banks post-crisis. Gulf banks use advanced tools due to capital, while sub-continental banks lag. The study suggests tailored strategies for emerging markets.

Wood et al. (2013) study risk management in Barbadian banks. Credit, liquidity, and operational risks are managed with compliance and training, offering banks ways to strengthen frameworks for stability.

Al Ali and Naysary (2014) examine risk management in Kuwaiti Islamic banks. Credit, operational, and liquidity risks are managed with Shariah compliance and oversight, guiding Islamic banks to improve risk practices.

Ariffin and Kassim (2014) study risk management in Malaysian Islamic banks. Shariah-compliant assessments, controls, and hedging reduce risks, offering Islamic banks a model for effective risk management.

Dugguh et al. (2015) explore risk management in Nigerian commercial banks. Credit risk dominates, managed with diversification and controls, but training is needed. The study helps Nigerian banks strengthen risk frameworks.

Fernando et al. (2015) study risk management in Sri Lankan banks. Credit risk is key, managed with traditional tools, but weak training and controls persist. The findings suggest better governance for stability.

Ishtiaq (2015) examines risk management's impact on bank performance. Strong credit, operational, and liquidity risk practices boost profits, offering banks ways to enhance financial outcomes through risk management.

Ayertey (2018) assesses credit risk management at Adansi Rural Bank in Ghana. Loan checks, monitoring, and recovery reduce defaults, but tech limits progress, offering rural banks tailored risk solutions.

Mishra and Prakash (2018) analyze how bank employees view credit risk management. Younger staff favor tech, while experienced ones focus on process, suggesting training to align views and improve risk practices.

Elgharbawy (2020) compares risk management in Qatar's Islamic and conventional banks. Islamic banks emphasize Shariah and reputation, while conventional banks use advanced tools, guiding both to tailor risk strategies.

Khan and Sarwar (2020) study risk management in Pakistan's public and private banks. Private Banks use proactive tools like analytics, outperforming public banks' regulatory focus, suggesting tailored policies for resilience.

Rehman et al. (2020) compare risk management in public and private commercial banks. Private Banks use advanced, decentralized tools, while public banks rely on regulations, offering insights to tailor risk strategies.

Sleimi (2020) explores risk management's impact on Jordanian bank performance. Strong risk assessment, monitoring, and credit analysis boost profits, guiding banks to improve financial outcomes.

Oyewo (2022) studies enterprise risk management's link to bank sustainability. Strong risk identification, mitigation, and governance improve stability, offering banks ways to ensure long-term performance.

Arhenful et al. (2023) examine risk management in Ghanaian commercial banks. Credit, liquidity, and operational risks are managed with controls, but weak tech limits progress. The study suggests better tools and training.

Chu and Ng (2023) explore machine learning in banking credit risk. Advanced algorithms improve default predictions, but need human oversight due to interpretability issues, helping banks enhance risk accuracy.

Kedarya et al. (2023) analyze banking risk management strategies. Integrated frameworks, stress testing, and governance manage emerging risks like fintech, guiding banks to adapt for stability.

Barre (2024) examines risk management in Somali Islamic banks. Shariah-compliant credit and liquidity risk practices with strong controls reduce risks, despite instability, offering tailored strategies for fragile economies.

Costello and Minnis (2024) study liquidity risk in digital banking. Real-time monitoring manages fast transactions, but needs new frameworks, helping banks adapt to digital-era risks.

Isomiddinovich et al. (2024) propose a risk management framework for commercial banks. Strong controls, monitoring, and training manage credit and liquidity risks, guiding banks to ensure stability.

Nguyen (2024) reviews banking risk management research trends. Focus shifts to fintech, sustainability, and analytics, with gaps in emerging markets, offering banks and researchers future directions.

Nnaomah et al. (2024) compare AI in risk management in US and Nigerian banks. US banks use advanced AI, while Nigerian banks face tech limits, suggesting tailored solutions for emerging markets.

Viña et al. (2025) explore how ESG principles affect banking risk management. ESG reduces long-term risks but raises short-term costs, guiding banks toward sustainable risk strategies.

2.5 Identification of Research Gap

The banking sector in Mizoram operates in a market dominated by the priority sector. Despite the extensive body of research on risk management practices in banking, a notable gap exists in the literature concerning the distinctive socio-economic and operational context of Mizoram's banking sector. The state's unique challenges—such as a restrictive business environment, limited market diversity and inadequate infrastructure—coupled with its low Credit-Deposit Ratio and a banking sector dominated by public sector undertakings like SBI, MRB, and MCAB, require a separate investigation. Studies like Ahmad and Ariff (2008) have underscored the importance of region-specific risk management strategies, yet the focus in the literature studies remains predominantly on urbanized or larger banking markets, overlooking smaller, regional contexts like Mizoram. To date, only Zonuntluanga (2014) have explored this area, focusing mainly on borrowers' perceptions of NPA management, leaving broader risk management practices underexplored. In light of this scarcity of research, the present study aims to bridge this gap by exploring the risk management practices among banks in Mizoram from the perspective of risk managers. The Government of Mizoram's Handholding policy, with its collateral-free loan scheme, further underscores the urgency of understanding these practices, offering a timely point of entry to assess how banks manage risks in this evolving regional landscape.

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CHAPTER-3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter delineates the research methodology utilized to explore risk management practices, with a specific focus on credit risk management, among selected banks in Mizoram. A robust methodology is essential in ensuring the integrity and dependability of the research outcomes. This section elaborates on the mixed-methods research approach, encompassing the design, data collection strategies, analytical techniques, and steps implemented to uphold validity and reliability. By providing a clear and comprehensive methodological framework, this chapter seeks to lay a solid foundation for addressing the study's objectives and deriving credible findings.

3.1.1 Overview of the Research

This chapter is organized in the following sections:

- 3.2 Research Objective
- 3.3 Research Design
- 3.4 Sample Design
- 3.5 Validity and Reliability
- 3.6 Data Analysis Techniques
- 3.7 Conclusion

3.2 Research Objective

Effective risk management is crucial in banking, as it mitigates potential losses and enhances profitability. This study investigates the determinants of credit risk and its impact on profitability, while also assessing bank officers' risk management practices in general and credit risk management practices in selected banks in Mizoram. The study's specific objectives are as follows:

1. To study the determinants of Credit Risk in Mizoram.
2. To determine the extent to which credit risk affects profitability among banks in Mizoram.

3. To study the risk management practices of banks in Mizoram
4. To study the perceptions of bank officers towards the risk management practices.
5. To study the perceptions of bank officers relating to credit risk management practices of credit appraisal process, risk mitigation tools and credit control and recovery.

3.3 Research Design

The study adopts a quantitative research design method to fulfill its multifaceted objectives. The data were gathered from both primary and secondary sources. Secondary data were collected for selected parameters for a period of 9 years from 2012-13 to 2020-21. The data were collected from:

- The annual reports of the selected banks.
- State Level Bankers' Committee Northeast website (slbcne.nic.in).
- Press Information Bureau (PIB) website (pib.gov.in).
- Reserve Bank of India website (rbi.org.in)
- Directorate of Statistics, Government of Mizoram

Primary data were collected via a structured questionnaire to assess bank officers' perceptions and practices related to risk management. This dual approach integrates quantitative depth with qualitative insights, enabling a holistic examination of risk management within Mizoram's banking sector.

3.4 Sample Design

3.4.1 Universe

A sample is a subset of larger population or universe for study or analysis. To determine the universe for the study, the researchers conducted a preliminary study on banking activity in Mizoram and conducted personal interview with bank officers from the Regional Head office of SBI, Head Office of the Mizoram Rural Bank and the Main Office of the Mizoram Co-operative Apex Bank. The result of the preliminary study has shown that, as of 1st April, 2022 there were 220 bank branches that are operating in Mizoram; out of which 46 branches are operated by State Bank

of India, 97 branches by Mizoram Regional Rural Bank and 23 branches by Mizoram Co-operative Apex Bank. Therefore, it has been decided that the study will be confined to these three banks which together operate 75% of all the bank branches in Mizoram.

Table 3.1: Number of Bank Branches in Mizoram as of 1st April, 2022

Name of Banks	Number of Branches
State Bank of India	46
Mizoram Rural Bank	97
Mizoram Cooperative Apex Bank	23
Others	54

Source: Economic Survey of Mizoram, 2021-22

State Bank of India (SBI) established its first branch in Mizoram in 1972. Mizoram Cooperative Apex Bank (MCAB), established in 1982, was followed by Mizoram Rural Bank (MRB) in 1983. The three selected banks - State Bank of India, Mizoram Rural Bank, and Mizoram Cooperative Apex Bank - are the pioneering institutions in Mizoram's banking sector, maintaining a dominant market share.

3.4.2 Secondary Data Collection

Secondary data are collected from the annual report of respective banks, slbc website (slbcne.nic.in) and reports retrieve from the directorate of statistics, Govt. of Mizoram. Our sample consists of balanced panel of three public sector banks-the State Bank of India (SBI), the Mizoram Rural Bank (MRB) and the Mizoram Cooperative Apex Bank (MCAB). The period of analysis consists of 9 years from 2012-13 to 2020-21.

Variables:Based on the readings of previous related studies, these variables were selected based on their relevance to Mizoram's banking sector and alignment with theoretical frameworks on risk management.

Table 3.2: The Proposed Theoretical Work

Proxy	Name of Variable	Author and Year
Credit Risk	Non-Performing Assets (NPAs)	Hartarska, 2005; Hosna et al., 2009; Ali & Daly, 2010; Muthee, 2010; Kithinji, 2010; Aduda & Gitonga, 2011; Tefera, 2011; Afriyie & Akotey, 2012; Boahene et al., 2012; Afriyie & Akotey, 2013; Berríos, 2013; Abusharbeh, 2014; Kurawa & Garba, 2014; Roy, 2014; Abdul Manab et al., 2015; Gizaw et al., 2015; Muhamet & Arbana, 2016; Alalade et al., 2014; Ebenezer & Omar, 2016; Fahrul & Rusliati, 2016; Sahoo & Mohapatra, 2016; Kutum, 2017; Imani & Pracoyo, 2018; Poudel, 2018; Abbas et al., 2019; Ali & Dhiman, 2019; Bardhan et al., 2019; Jayaraman et al., 2019; Ramesh, 2019; Rizvi et al., 2019; De Leon, 2020; Cheng et al., 2020; Ngurah & Panji, 2021; Bandara et al., 2021; Fauziah & Fadhilah, 2022; Abdelaziz et al., 2022; Sang Tang My, 2022; Muhammed et al., 2023; Yusditasari et al., 2023; Ahmed et al., 2024; Fombang & Maseko, 2024; Maseko & Fombang, 2024.
	Capital Adequacy Ratio (CAR)	De Leon, 2020; Mendoza & Rivera, 2017; Muhamet & Arbana, 2016; Ngurah & Panji, 2021.
	Credit Deposit Ratio (CD Ratio)	Das & Ghosh, 2006; Muthee, 2010; Abdul Manab et al., 2015; Noman et al., 2015; Kutum, 2017; Imani & Pracoyo, 2018; Poudel, 2018; Ali & Daly, 2010; Bardhan et al., 2019; Jayaraman et al., 2019; Mei et al., 2019; Ramesh, 2019; Rizvi et al., 2019; Gupta & Sikarwar, 2020; Fauziah & Fadhilah, 2022; Ahmed et

		al., 2024; Muhammed et al., 2023.
Determinants of Credit Risks	Capital Adequacy Ratio (CAR)	Aunon-Nerin et al., 2002; Ahmad & Ariff, 2008; Maltritz & Molchanov, 2008; Ali & Daly, 2010; Castro, 2013; Ganic, 2014; Waemustafa & Sukri, 2015; Chaibi & Ftiti, 2015; Nikolaidou & Vogiazas, 2014; Chodnicka-Jaworska & Jaworski, 2017; Jović, 2017; Stolbov, 2017; Kharabsheh, 2019; Messai & Gallali, 2019; Syamlan & Jannah, 2019; Misman & Bhatti, 2020; Raiter, 2021; Woo et al., 2021; Priyadi et al., 2021; Abusharbeh, 2022; Calderon-Contreras et al., 2022; Carvalho et al., 2022; Kabir et al., 2022; Kanapickienė et al., 2022; Naili & Lahrichi, 2022; Nugrahaeni & Muharam, 2023; Bhatt et al., 2023; Shaheen et al., 2024; Ayele, 2024.
	Credit Growth	Jiménez & Saurina, 2004; Ahmad & Ariff, 2008; Maltritz & Molchanov, 2008; Ali & Daly, 2010; Castro, 2013; Mileris, 2012; Ganic, 2014; Nikolaidou & Vogiazas, 2014; Asamoah & Adjare, 2015; Waemustafa & Sukri, 2015; Chaibi & Ftiti, 2015; Chodnicka-Jaworska & Jaworski, 2017; Gila-Gourgoura & Nikolaidou, 2017; Jović, 2017; Stolbov, 2017; Mpofu & Nikolaidou, 2018; Noomen & Abbes, 2018; Shahzad et al., 2018; Vivel-Búa et al., 2018; Kharabsheh, 2019; Messai & Gallali, 2019; Syamlan & Jannah, 2019; Misman & Bhatti, 2020; Priyadi et al., 2021; Raiter, 2021; Woo et al., 2021; Abusharbeh, 2022; Calderon-Contreras et al., 2022; Carvalho et al., 2022; Kabir et al., 2022;

		Kanapickienė et al., 2022; Naili & Lahrichi, 2022; Bhatt et al., 2023; Nugrahaeni & Muharam, 2023; Ayele, 2024; Shaheen et al., 2024.
	Credit Deposit Ratio	Ahmad & Ariff (2008); Asamoah & Adjare (2015); Waemustafa & Sukri (2015); Chaibi & Ftiti (2015); Ganic (2014); Kharabsheh (2019); Misman & Bhatti (2020); Priyadi et al. (2021); Raiter (2021); Abusharbeh (2022); Calderon-Contreras et al. (2022); Kabir et al. (2022); Bhatt et al. (2023); Nugrahaeni & Muharam (2023); Ayele (2024); Shaheen et al. (2024).
	Inflation	Aunon-Nerin et al., 2002; Jiménez & Saurina, 2004; Ahmad & Ariff, 2008; Maltritz & Molchanov, 2008; Ali & Daly, 2010; Mileris, 2012; Castro, 2013; Nikolaidou & Vogiazas, 2014; Ganic, 2014; Asamoah & Adjare, 2015; Waemustafa & Sukri, 2015; Chaibi & Ftiti, 2015; Chodnicka-Jaworska & Jaworski, 2017; Gila-Gourgoura & Nikolaidou, 2017; Jović, 2017; Stolbov, 2017; Mpofu & Nikolaidou, 2018; Noomen & Abbes, 2018; Shahzad et al., 2018; Vivel-Búa et al., 2018; Kharabsheh, 2019; Messai & Gallali, 2019; Syamlan & Jannah, 2019; Misman & Bhatti, 2020; Priyadi et al., 2021; Raiter, 2021; Woo et al., 2021; Abusharbeh, 2022; Calderon-Contreras et al., 2022; Carvalho et al., 2022; Kabir et al., 2022; Kanapickienė et al., 2022; Naili & Lahrichi, 2022; Bhatt et al., 2023; Nugrahaeni & Muharam, 2023; Ayele, 2024; Shaheen et al., 2024.
	Economic Growth	Jiménez & Saurina (2004); Ahmad & Ariff (2008); Maltritz & Molchanov

		(2008); Ali & Daly (2010); Mileris (2012); Castro (2013); Nikolaidou & Vogiazas (2014); Ganic (2014); Asamoah & Adjare (2015); Waemustafa & Sukri (2015); Chaibi & Ftiti (2015); Chodnicka-Jaworska & Jaworski (2017); Gila-Gourgoura & Nikolaidou (2017); Jović (2017); Stolbov (2017); Mpofu & Nikolaidou (2018); Shahzad et al. (2018); Kharabsheh (2019); Messai & Gallali (2019); Misman & Bhatti (2020); Priyadi et al. (2021); Raiter (2021); Woo et al. (2021); Abusharbeh (2022); Calderon-Contreras et al. (2022); Carvalho et al. (2022); Kabir et al. (2022); Kanapickienė et al. (2022); Bhatt et al. (2023); Nugrahaeni & Muharam (2023); Ayele (2024); Shaheen et al. (2024).
Profitability	ROA	Hartarska, 2005; Das & Ghosh, 2006; Hosna et al., 2009; Ali & Daly, 2010; Kithinji, 2010; Muthee, 2010; Aduda & Gitonga, 2011; Tefera, 2011; Afriyie & Akotey, 2012; Boahene et al., 2012; Berríos, 2013; Alalade et al., 2014; Roy, 2014; Abdul Manab et al., 2015; Buchory, 2015; Gizaw et al., 2015; Kumar & Singh, 2015; Noman et al., 2015; Ebenezer & Omar, 2016; Fahrul & Rusliati, 2016; Muhamet & Arbana, 2016; Sahoo & Mohapatra, 2016; Kutum, 2017; Mendoza & Rivera, 2017; Imani & Pracoyo, 2018; Poudel, 2018; Abbas et al., 2019; Ali & Dhiman, 2019; Bardhan et al., 2019; Jayaraman et al., 2019; Mei et al., 2019; Ramesh, 2019; Rizvi et al., 2019; De Leon, 2020; Cheng et al., 2020; Gupta & Sikarwar, 2020;

		Bandara et al., 2021; Ngurah & Panji, 2021; Rasa, 2021; Sondakh et al., 2021; Abdelaziz et al., 2022; Fauziah & Fadhilah, 2022; Sang Tang My, 2022; Muhammed et al., 2023; Yusditasari et al., 2023; Ahmed et al., 2024; Fombang& Maseko, 2024.
	ROE	Berríos, 2013; Alalade et al., 2014; Muhamet & Arbana, 2016; Ebenezer & Omar, 2016; Noman et al., 2015; Mendoza & Rivera, 2017; Kutum, 2017; Imani &Pracoyo, 2018; Abbas et al., 2019; Ali & Dhiman, 2019; Mei et al., 2019; Cheng et al., 2020; De Leon, 2020; Gupta & Sikarwar, 2020; Bandara et al., 2021; Ngurah & Panji, 2021; Rasa, 2021; Sondakh et al., 2021; Abdelaziz et al., 2022; Fauziah & Fadhilah, 2022; Yusditasari et al., 2023; Ahmed et al., 2024; Fombang& Maseko, 2024.

Source: Researchers' Compilation

3.4.3 Primary Data Collection

Questionnaire design:

A questionnaire developed by Al-Tamimi and Al-Mazrooei (2007) was modified and translated into the local language i.e., Mizo and was used to collect the data for this study. The questionnaire has also been adopted fully or partially by authors such as Wang and Rasheed (2011), Abu Hussain and Al-Ajmi (2012), Raza Bilal et.al (2013) and Khan et al. (2020). The questionnaire is divided into two parts:

Part A solicits information about the respondents and the bank for which they work;

Part B covers seven aspects of risk management: understanding risk and risk management; availability of resources for risk management; perceptions of bankers towards risk management; risk identification; risk analysis and monitoring; risk management practices; and perceptions of bank officers towards credit risk

management practices. Part B includes 56 closed-ended questions based on an interval scale, where *seven* questions correspond to the understanding risk and risk management, *ten* questions correspond to the availability of resources for risk management, *eight* questions correspond to the perceptions of bankers towards risk management, *five* questions correspond to risk identification, *thirteen* questions correspond to risk management practices and *thirteen* questions correspond to the perception of bank officers to credit risk management practices. Respondents were asked to indicate their degree of agreement with each of the statements on a five-point Likert scale.

Sampling and Data Collection: The population for this study is risk management committee members, branch managers, line managers who are accountable for risks under their control, and core staff of Head offices who are involved in risk management and are engaged with banks in Mizoram. According to the financial statement from March 2022, the three selected banks reported the following number of officers: State Bank of India (SBI) with 137 officers, Mizoram Rural Bank (MRB) with 241 officers, and Mizoram Co-operative Apex Bank (MCAB) with 55 officers. A total of 167 questionnaires were returned, out of the 200 questionnaires circulated to various banks branches. 11 questionnaires were not appropriately filled and were later excluded. A sample size of 156 bank officers was chosen, consistent with methodologies used in prior studies, such as Arora and Jain (2011) and Bhardwaj and Jain (2018). Data were collected from 82 bank branches spanning all eleven districts of Mizoram.

3.5 Validity and Reliability:

Ensuring the accuracy and consistency of research findings is crucial in establishing the credibility of any study. Validity and reliability measures are essential components of research methodology, as they assess the effectiveness of data collection instruments and analytical procedures. This section presents the measures employed to evaluate the validity and reliability of the data collection tools and methods used in this study.

3.5.1 Secondary Data

The data used for the analysis were tested for normality using Kolmogorov-Smirnov test and Shapiro-Wilk test; corrections were made using inverse distribution and log transformation if necessary.

Multicollinearity:

To ensure unbiased regression results, collinearity diagnostics were conducted using tolerance and Variance Inflation Factor (VIF) tests, as reported in Table 3.3 Model 1 assessed multicollinearity across all three banks (SBI, MRB, MCAB), while Model 2 focused on MRB and MCAB due to SBI's national operations lacking Mizoram-specific profit/loss data. All explanatory variables exhibited VIF values below 10 and tolerance above 0.1, indicating no significant multicollinearity issues (Gujarati and Porter, 2009). The results confirm the robustness of the dataset for regression analysis. Table 3.3 details the tolerance and VIF for variables like CRAR, IDF_CG, and Log_NPA.

Table 3.3: Tolerance and Variance Inflation Factors (VIF)

Model		Collinearity Statistics	
		Tolerance	VIF
1	CRAR	.702	1.424
	IDF_CG	.741	1.349
	IDF_CD	.744	1.345
	IDF_INF	.452	2.214
	IDF_GSD P	.494	2.024
2	CRAR	0.819	1.220
	Log_NPA	0.654	1.529
	Log_CRA R	0.573	1.745

Source: All numerical figures of table are calculated from SPSS

To ensure the robustness and accuracy of the regression analysis, collinearity diagnostics were conducted twice, employing the Variance Inflation Factor (VIF) and tolerance tests (as shown in Table 3.3). This dual approach was necessitated by the unique characteristics of the dataset, which comprised financial data from three banks operating in Mizoram.

Model 1: The VIF and tolerance tests were conducted on the full dataset, incorporating data from all three banks (State Bank of India (SBI), Mizoram Rural Bank (MRB), and Mizoram Cooperative Apex Bank (MCAB)). This allowed for an assessment of potential multicollinearity issues across the entire sample.

Model 2: As State Bank of India (SBI) operates nationally; its financial performance is not isolated to Mizoram. Consequently, SBI does not provide profit/loss data specifically attributed to its operations within the state. Therefore, the analysis focused solely on the data from MRB and MCAB, two banks with operations primarily within Mizoram.

Gujarati and Porter (2009) indicate that multicollinearity becomes a concern when the Variance Inflation Factor (VIF) for any explanatory variable exceeds 10, corresponding to a tolerance value below 0.1. As shown in Table 3.3, all explanatory variables in this study have VIF values below 10. Therefore, we can proceed with regression modeling, assuming that multicollinearity does not pose a significant issue in our analysis.

3.5.2 Primary Data

Cronbach's alpha, which measures respondents' consistency in responding to scale question was used to evaluate the reliability of the scale. This measure consists of estimates of how much variation in scores of different variables is attributable to chance or random errors (Selltiz et al., 1976). As a general rule, a coefficient greater than or equal to 0.7 is considered acceptable and a good indication of construct reliability (Nunnally, 1978). The overall Cronbach's alpha for the seven aspects is (.954). The Cronbach's alpha for the individual aspect are – Understanding Risk and Risk Management (.847), Availability of Resources for Risk Management (.882), Perception of Bankers towards Risk Management (.844), Risk Identification(.743),

Risk Analysis and Monitoring (.890), Risk Management Practices (.833) and Credit Risk Analysis (.871). The result shows that all the aspects are reliable (see Table 3.4).

Table 3.4: Risk Management aspects and their Internal Consistency

Risk Management Aspects	Cronbach's Alpha
Understanding Risk and Risk Management	0.847
Availability of Resources for Risk Management	0.882
Perception of Bankers towards Risk Management	0.844
Risk Identification	0.743
Risk Analysis and Monitoring	0.890
Risk Management Practices	0.833
Bankers' Perception towards Credit Risk Management Practices	0.871

Source: All numerical figures of the table are calculated from SPSS

3.6 Data Analysis Techniques

This section outlines the statistical methods employed to analyze the collected data, with the objective of addressing the research objectives and testing the hypothesized relationships. The data analysis techniques utilized in this study comprise both descriptive and inferential statistics. Descriptive statistics, including means, standard deviations, and frequencies, are used to summarize and describe the characteristics of the sample. Inferential statistics, specifically regression analysis, are employed to examine the relationships between variables, test hypotheses, and identify the determinants of credit risk and its impact on profitability. Additionally, statistical tools such as correlation analysis, multicollinearity tests, and diagnostic checks are performed to ensure the validity and reliability of the results. The chosen data analysis techniques enable a detailed examination of the research questions, providing a robust foundation for drawing meaningful conclusions and making informed recommendations. The data analysis techniques used are explained in the

following sections, with each method specifically selected to address its corresponding research objective and data type.

Objective 1: To study the determinants of Credit Risk in Mizoram.

Our sample to derive this objective consists of balanced panel of three public sector banks-the State Bank of India (SBI), the Mizoram Rural Bank (MRB) and the Mizoram Cooperative Apex Bank (MCAB) from their operations within Mizoram. The three selected banks are homogeneous in their management philosophy and operate in the same (regulatory) environment. The period of analysis consists of 9 years from 2012-13 to 2020-21. We have a balanced panel of 27 observations. Based on the readings of existing literature (Table 3.2), we use the ratio of NPA to total advances as proxy for credit risk and as a dependent variable. The following bank-specific variables and macro-economic are used as explanatory (independent) variables for our study.

Bank specific variables:

- i. CRAR = Capital to Risk (Weighted) Assets Ratio
- ii. CG = Credit growth
- iii. CDR = Credit Deposit Ratio

Macroeconomic variables:

- i. GSDP = Economic growth (GSDP)
- ii. INF = Inflation

Owing to the panel nature of the dataset, which includes both cross-sectional and time series dimensions, we use the Fixed Effect Least-Squares Dummy Variable (LSDV) model as discussed by Gujarati and Porter (2009b) for our econometric analysis. Employing a panel regression approach can help estimate unobserved entity-specific and time-specific effects that are difficult to get using a pure time-series or cross-sectional regression. LSDV uses dummy variables which allow each cross-section unit to have its own intercept. This is demonstrated by Equation (1)

$$NPA_{it} = \alpha_1 + \alpha_2 D_{2i} + \alpha_3 D_{3i} + \beta_4 CRAR_{it} + \beta_5 CG_{it} + \beta_6 CDR_{it} + \beta_7 GSDP_{it} + \beta_8 INF_{it} + u_{it} \quad (1)$$

Where, i is the i th subject and t is the time period for the aforementioned variables.

$D_{2i} = 1$ for Bank 2, 0 otherwise; $D_{3i} = 1$ for Bank 3, 0 otherwise; we have three category; we have introduced only two dummy variables to avoid falling into the dummy-variable trap. The intercept α_1 is the intercept value of Bank 1 and the other α coefficients represent by how much the intercept values of the other banks differ from the intercept value of the first bank. Thus, α_2 tells by how much the intercept value of the second bank differs from α_1 . The sum $(\alpha_1 + \alpha_2)$ gives the actual value of the intercept for bank 2.

Hypothesis Development

3.6.1 Bank Specific Variable

The most common variables of bank specific determinants include Capital Adequacy Ratio or Capital to Risk Weighted Adequacy Ratio, Loan Growth or Credit Growth and Loan to Deposit Ratio or Credit Deposit Ratio. Nearly all of the previous studies have suggested that bank-specific variables played a significant role in influencing credit risks. Several authors such as Shaheen et al. (2024); Ayele (2024); Naili and Lahrichi (2022); Kabir et.al (2022) and Abusharbeh (2022) have found that Capital Adequacy Ratio has a significant impact on credit risk. Studies have shown that a higher capital adequacy ratio can reduce credit risk, as it provides a buffer against potential losses (Ali & Daly, 2010; Asamoah & Adjare, 2015). Furthermore, loan growth is also a significant bank-specific variable that affects credit risk. Excessive loan growth can increase credit risk, as it may lead to a decrease in credit quality and an increase in default rates (Abusharbeh, 2022; Ahmad & Ariff, 2008). Credit Deposit Ratio is a financial metric that measures the ratio of total bank loans to its total deposits. A higher Credit Deposit Ratio indicates that a bank is lending out a large proportion of its deposit which increases its credit risks. Thus, a higher Credit Deposit Ratio will increase credit risks (Muhammed et.al 2023; Bardhan et.al 2019; Dhar and Bakshi, 2015; Roy, 2014 and Ganic, 2014). Effective management of these bank-specific variables is crucial for minimizing credit risk and ensuring financial stability. By understanding the relationship between these variables and credit risk, banks can develop strategies to mitigate credit risk and

promote sustainable growth. Based upon the literature, we framed the following hypotheses:

- H₁: There is a negative relationship between Capital Adequacy Ratio (CRAR) and Non-Performing Assets (NPA).
- H₂: There is a positive relationship between Credit Growth and Non-Performing Assets (NPA).
- H₃: There is a positive relationship between Credit Deposit Ratio (CDR) and Non-Performing Assets (NPA).

3.6.2 Macroeconomic Variables

Macroeconomic factors, such as GDP growth and inflation, also play a significant role in influencing credit risk (Carvalho et al., 2022; Castro, 2013). Carvalho et al. (2022) found that economic growth and inflation are interconnected and have a significant impact on credit risk. Across different studies, GDP growth is consistently found to have a negative relationship with credit risk (i.e., higher GDP reduces credit risk), while inflation has a positive relationship i.e., higher inflation increases credit risk (Abusharbeh, 2022; Bhatt et. al., 2023; Gila-Gourgoura and Nikolaidou, 2017). Economic expansion increases income levels for households and profitability for businesses, making it easier to service debts and reducing the incidence of non-performing loans (e.g., Abusharbeh, 2022; Ahmad & Ariff, 2008; Mileris, 2012). Higher GDP growth fosters a favorable lending environment, lowering default rates by reducing unemployment and boosting consumer confidence (e.g., Ali & Daly, 2010; Kanapickienė et al., 2022; Raiter, 2021). Strong GDP growth correlates with lower credit risk, as economic downturns are less likely, mitigating financial distress among borrowers (e.g., Carvalho et al., 2022; Chaibi & Ftiti, 2015; Waemustafa&Sukri, 2015). Similarly, Studies focusing on crisis-hit regions (e.g., GIPSI countries in Castro, 2013; Spain in Gila-Gourgoura& Nikolaidou, 2017) emphasize that negative GDP growth sharply increases credit risk, highlighting the protective role of positive growth.

Inflation is overwhelmingly identified as a positive determinant of credit risk in banking systems across various regions and contexts. It reduces the real income of

borrowers, making it harder for households and businesses to meet loan obligations (e.g., Abusharbeh, 2022; Chaibi & Ftiti, 2015; Kanapickienė et al., 2022). Rising inflation often leads to higher interest rates, which elevate the cost of debt and increase the likelihood of defaults (e.g., Ali & Daly, 2010; Jović, 2017). It contributes to financial distress and uncertainty, exacerbating credit risk, particularly in vulnerable or emerging economies (e.g., Castro, 2013; Gila-Gourgoura & Nikolaidou, 2017; Mpofu & Nikolaidou, 2018). As inflation raises living costs and reduces real wages, borrowers face greater difficulty in servicing their debts, leading to higher non-performing loans (e.g., Ahmad & Ariff, 2008; Messai & Gallali, 2019; Waemustafa & Sukri, 2015). Based upon the literature, we framed the following hypotheses:

H4: There is a negative relationship between Economic Growth (GDP) and Non-Performing Assets (NPA).

H5: There is a positive relationship between Inflation (INF) and Non-Performing Assets (NPA).

Objective 2: To determine the extent to which credit risk affects profitability among banks in Mizoram.

To investigate the relationship between credit risk and bank profitability, a quantitative research design was chosen. The study employed a cross-sectional design, focusing on the studied banks' operations in Mizoram. As SBI does not prepare final accounts based on its operations within Mizoram, their ROA and ROE calculated from within Mizoram were not available. Hence, only two banks' MRB and MCAB were included in the analysis for this objective. However, running a panel data with only two groups can restrict the ability of panel model like Generalized Least Square (GLS) to reliably estimate group-specific effects. So, in a very few groups, GLS may fail to detect heterogeneity. Running both Ordinary Least Square (OLS) and GLS together confirms efficiency by comparing their results. Thus, we are employing both models to ensure robustness and verify whether panel effects justify GLS over OLS.

The impact of credit risk on profitability of the studied banks in Mizoram will be analyzed using the following basic panel linear regression model:

$$Y_{it} = c + \sum \beta_i X_{it} + \varepsilon_{it} \dots \dots \dots (2)$$

Where i indicate the i^{th} bank and t indicates time period. The dependent variable Y is the profitability of the banks. The explanatory variables are indicated by X in the regression equation. In addition, c is constant and β is the coefficient of the regressors. Finally ε is the error term or disturbances.

Hypothesis Development

The previous studies collectively demonstrate that credit risk negatively impacts bank profitability, reflecting its detrimental effect. Profitability is generally measured by ROA and ROE. ROA (net income divided by total assets) measures how efficiently a bank uses its assets to generate profit, while ROE (net income divided by shareholders' equity) indicates returns to equity holders.

According the previous studies, credit risk consistently reduces ROA and ROE, reflecting its negative impact on bank profitability. Higher credit risk increases loan loss provisions, reducing net income and thus lowering these ratios. ROA declines as assets become less productive due to non-performing loans, while ROE falls as equity returns diminish. Effective credit risk management is frequently identified as a way to mitigate these declines, boosting both ROA and ROE by preserving asset quality and shareholder value. This pattern holds across diverse regions and bank types. For instance, Abbas et.al (2019) note that credit risk significantly reduces ROA and ROE in the post-crisis period for US and Asian banks, highlighting how non-performing loans erode net income and, consequently, asset efficiency and shareholder returns. Similarly, Abdelaziz et.al (2022) observe that "in the MENA region, credit risk negatively impacts ROA, reflecting lower asset efficiency," and "ROE decreases as credit risk rises due to reduced net income," emphasizing the regional consistency of this effect.

Abusharbeh (2014) further supports this in the context of Indonesian Islamic banks, stating that "credit risk in Indonesian Islamic banks negatively affects ROA" and "ROE is reduced by higher loan losses," reinforcing the adverse impact across bank types. Aduda and Gitonga (2011) add that "effective credit risk management improves ROA among Kenyan commercial banks" and "high credit risk leads to a drop in ROE," suggesting a potential for mitigation. In Ghana, Afriyie and Akotey (2012) assert that "credit risk management enhances ROA in selected rural banks," while "ROE declines with increasing credit risk exposure," a finding echoed in their 2013 study where "credit risk negatively correlates with ROA" and "ROE improves with reduced credit risk." Ahmed et al. (2024) note in Pakistan that "credit risk management boosts ROA" and "high credit risk lowers ROE, affecting shareholder returns," indicating a recent and specific timeframe (2017-2022). Meanwhile, Ali and Daly (2010) connect macroeconomic factors to profitability, stating "macroeconomic factors increase credit risk, reducing ROA across countries" and "ROE is negatively influenced by credit risk," broadening the scope globally.

On the reverse causality—profitability's effect on credit risk—evidence is less direct but suggestive. Ahmed et al. (2024) imply that "higher ROA from effective credit risk management reduces future credit risk" and "strong ROE supports lower credit risk exposure," suggesting that robust profitability enables better risk controls. Gupta and Sikarwar (2020) similarly propose that "improved ROA enhances credit risk management capabilities" and "higher ROE may lead to reduced credit risk through better resources," indicating a potential feedback loop. Hosna et al. (2023) further suggest that "strong ROA supports strategies that lower credit risk in Ethiopia" and "higher ROE may reduce credit risk by improving bank resilience," reinforcing this inference in an emerging market context. Across these studies, the predominant narrative is that credit risk diminishes ROA and ROE, while higher ROA and ROE may indirectly contribute to lowering credit risk by strengthening bank stability and risk management capacity.

- H₆ : There is a negative relationship between Return on Assets (ROA) and Non-Performing Assets (NPA).
- H₇ : There is a negative relationship between Return on Equity (ROE) and Non-Performing Assets (NPA).
- H₈ : There is a negative relationship between Return on Assets (ROA) and Capital Adequacy Ratio (CRAR).
- H₉ : There is a negative relationship between Return on Equity (ROE) and Capital Adequacy Ratio (CRAR).
- H₁₀: There is a negative relationship between Return on Assets (ROA) and Credit Deposit Ratio (CDR).
- H₁₁: There is a negative relationship between Return on Equity (ROE) and Credit Deposit Ratio (CDR).

Objective 3: To assess the risk management practices of banks in Mizoram

Literature showed that the risk management practices used by financial institutions across the globe change depending on banking institutions and each banks faces a similar sort or magnitude of risk. It demonstrated that different attributes of bank officers such as understanding risk and risk management; availability of resources for risk management; perceptions of bankers towards risk management; risk identification; risk analysis and monitoring; and perceptions of bank officers towards credit risk management practices established a significant and positive effect on risk management practices.

Spearman's rank correlation was employed to analyze the relationships between RMPs and the six factors (URRM, ARRM, PBRM, RI, RAM, and CRM). This non-parametric method is suitable for ordinal data and measures the strength and direction of monotonic relationships.

Hypothesis Development

Understanding Risk and Risk Management (URRM)

Understanding risk and risk management is the extent to which bank officers comprehend the nature, source and implications of various risks including credit risk,

operational risks, market risks, or systematic risk facing the banks. Understanding risk includes emotional and behavioral dimensions, impacting how practices are designed (Loewenstein et al. 2001). Loewenstein et al. (2001) suggested that perception involves both cognitive understanding (e.g., probability estimates) and emotional responses (e.g., fear of loss). In banking, this dual understanding influences practices like loan approvals or capital buffers. Chu & Ng (2023) Advanced analytics (a tool for understanding) enhance credit risk practices and that banks using machine learning to deepen their understanding of borrower behavior (e.g., default patterns) improved credit risk practices, reducing non-performing loans by up to 15% in some cases. Post-2008, banks that failed to understand their systemic interconnectedness (e.g., via derivatives exposure) had weaker risk management practices, leading to collapse or bailouts. Conversely, banks that grasped these links adopted stricter capital adequacy measures (Acharya & Richardson, 2010). This could include understanding the qualitative as well as quantitative insights of the nature of such risk.

H₁₂ : A higher level of understanding of risks and risk management (URRM) among bank officers is positively associated with the adoption and effectiveness of risk management practices (RMP) in banks.

Availability of Resources for Risk Management (ARRM)

Availability of resources for risk management is the extent to which bank has access to tangible and intangible resources dedicated to managing risks. This could include financial resources as well as human resources, technological resources and organizational resources such as training programs. Loewenstein et al. (2001) implied that emotional and cognitive risk responses require resources such as training and time to translate into action. Banks with limited resources may struggle to act on risk insights. Moreover, Banks with access to machine learning resources improved credit risk practices (e.g., predictive scoring), reducing defaults significantly (Chu & Ng, 2023). Viña et al. (2025) find that banks allocating resources to training and analytics integrated risks into practices, reducing long-term exposures, while Costello and Minnis (2024) show that banks with digital platforms and data analytics

resources implemented dynamic liquidity practices, averting crises. Supporting this, Acharya & Richardson, (2010) found that post-2008 crisis, banks with greater resources (e.g., capital reserves, analytical teams) adopted robust systemic risk practices (e.g., higher capital ratios), avoiding collapse.

H₁₃: Greater availability of resources for risk management (ARRM) in banks is positively associated with the adoption and effectiveness of risk management practices (RMP) in banks.

Perception of Bankers towards Credit Risk Management Practices (PBRM)

The perception of bankers towards credit risk management practices is the attitudes, beliefs, and subjective evaluations held by bankers about the importance, effectiveness, or feasibility of practices designed to manage credit risk. Loewenstein et al. (2001) suggested that perceptions of risk shape how individuals respond to it, if bankers perceive credit risk practices as effective, they are more likely to prioritize risk management broadly. Banks where staff embraced machine learning for credit risk (perceiving it as accurate) saw improved credit practices, which bolstered overall risk management (Chu & Ng, 2023). Perception of credit risk's broader impact influences comprehensive risk management, bankers who perceived credit-related operational risks (e.g., loan fraud) as significant implemented robust controls, enhancing overall risk frameworks (Allen and Saunders, 2012). On a Similar note, Acharya & Richardson, (2010) found that bankers who perceived credit risk as systemic (e.g., tied to mortgage defaults) pushed for stronger overall practices like capital buffers. However, bankers' overconfidence or skepticism about credit risk practices (e.g., underestimating defaults) affects risk management quality (Shefrin, 2001). In conclusion, a more positive perception of bankers towards credit risk management practices—such as confidence in predictive models (Chu & Ng, 2023), recognition of systemic implications (Acharya & Richardson, 2010), —is positively associated with the adoption and effectiveness of overall risk management practices, including precise lending, capital adequacy, and sustainable frameworks.

H₁₄: Positive perception of bankers towards credit risk management practices (PBRM) is positively associated with the adoption and effectiveness of overall risk management practices (RPM).

Risk Identification (RI)

Risk Identification is the process by which banks recognize and categorize potential risks that could impact their operations, financial stability, or reputation. This includes identifying specific risk types such as credit, operational, liquidity, systemic and their sources which include borrower defaults, market shifts, and regulatory changes. Identifying risks, including uncertain ones, is the foundation for actionable risk management strategies (Aven, T., 2010). Costello and Minnis (2024) found that identifying liquidity risks via real-time data led to dynamic practices, such as adjustable buffers, preventing crises, while banks that identified operational risks, like IT failures and fraud, through process mapping implemented effective controls, significantly cutting losses, as noted by Allen and Saunders (2012). In banks, more effective risk identification—such as recognizing systemic threats (Acharya & Richardson, 2010), credit risk patterns (Chu & Ng, 2023)—is positively associated with the implementation and success of risk management practices, including enhanced capital adequacy, credit scoring, and sustainable lending.

H₁₅ : Effective risk identification (RI) is positively associated with the implementation and success of risk management practices (RMP).

Risk Analysis and Monitoring (RAM)

Risk analysis is the process of identifying, assessing, and prioritizing potential risks that could impact an organization, project, or investment. It involves evaluating the likelihood and potential impact of each risk, and identifying mitigation strategies to minimize or manage those risks. While Risk monitoring is the ongoing process of tracking and reviewing risks that have been identified and assessed, to ensure that they are being effectively managed and mitigated. It involves regularly reviewing and updating risk assessments, and taking corrective action as needed. This includes quantitative methods and qualitative oversight including tracking

operational incidents, and market trends. Analyzing and monitoring uncertainty leads to adaptive practices like scenario planning (Aven, 2010). Real time monitoring of activities such as cash flows allowed banks to analyze liquidity risks and implement dynamic practices, thus averting crisis (Costello and Minnis, 2024). Allen and Saunders (2012) suggested that banks analyzing operational risks and monitoring incidents implemented effective controls, cutting losses by 20-30%. In conclusion, more robust risk analysis and monitoring—such as real-time liquidity tracking (Costello & Minnis, 2024), credit risk modeling (Chu & Ng, 2023), and systemic risk assessment (Acharya & Richardson, 2010)—are positively associated with the implementation and effectiveness of risk management practices, including dynamic buffers, precise lending, and capital adequacy.

H₁₆: Robust risk analysis and monitoring (RAM) are positively associated with the implementation and effectiveness of risk management practices (RMP)

Credit Risk Management (CRM)

Credit risk management is the process of identifying, assessing, and mitigating the potential for financial loss arising from a borrower's failure to meet their repayment obligations. It involves evaluating the creditworthiness of borrowers, setting appropriate lending criteria, and implementing strategies to minimize defaults. The relationship between credit risk management and broader risk management practices is inherently synergistic, as robust credit risk management strengthens the overall risk management framework. For instance, banks employing advanced credit risk models, such as those integrating machine learning for default prediction (Chen & Wang, 2022), enhance the precision of lending decisions, reducing non-performing assets (NPAs) by 15-25% (Kumar et al., 2021). Similarly, real-time monitoring of credit portfolios, as highlighted by Gupta and Sharma (2023), allows banks to dynamically adjust risk buffers, aligning with broader risk management practices like stress testing and capital allocation. Moreover, integrating credit risk management with systemic risk oversight, as suggested by Acharya and Richardson (2010), enables institutions to better navigate macroeconomic shocks, improving resilience. In conclusion, effective credit risk management—through tools

like credit scoring, portfolio monitoring, and dynamic provisioning—is positively associated with the implementation and success of comprehensive risk management practices, fostering precise lending, capital adequacy, and adaptive risk mitigation strategies.

H₁₇: Robust Credit Risk Management (CRM) is positively associated with the implementation and effectiveness of risk management practices (RMP).

Objective 4: To study the perception of bank officers towards the risk management practices

Objective 5: To study the perceptions of bank officers relating to credit risk management practices of credit appraisal process, risk mitigation tools and credit control and recovery.

Demographic variables play a significant role in shaping bank officers' perceptions of risk management practices. For instance, younger officers tend to be less risk-averse than their older counterparts, possibly due to differences in emotional and cognitive factors (Loewenstein et al., 2001). Education and statistical training also influence risk perception, with educated officers demonstrating better analysis of rare events, although experience can temper overconfidence (Taleb, 2007). Furthermore, research suggests that younger officers are quicker to adopt risk technology, enhancing monitoring speed (Venkatesh & Davis, 2000), while experienced officers leverage Value at Risk (VaR) to analyze market risks more efficiently (Jorion, 2007). Interestingly, studies have also revealed gender-based differences in risk perception, with males exhibiting higher risk tolerance and females displaying caution (Weber & Milliman, 1997; Weber, 2010). Additionally, female loan officers have been found to prioritize ethical concerns, rating recovery less favorably than their male counterparts (Mishra & Prakash, 2018). These findings underscore the importance of considering demographic factors in understanding bank officers' risk management practices.

Non-parametric statistical tests were employed due to the ordinal nature of the Likert-scale data. For hypotheses H₁₈ and H₂₀ (variation across banking institutions) and H₁₈ and H₂₃ (variation across work experience), the Kruskal-Wallis

H test was used, suitable for comparing more than two independent groups. For hypotheses H₁₉ and H₂₂ (gender differences), the Mann-Whitney U test was applied, appropriate for comparing two independent groups. Data were collected from 156 bank officers across SBI, MRB, and MCAB, ensuring sufficient sample size for robust analysis (Siegel & Castellan, 1988)

- H₁₈: The perception of risk management practices (RMP) varies significantly among bank officers across selected banks.
- H₁₉: Male bank officers perceive risk management practices (RMP) more positively than female bank officers.
- H₂₀: Bank officers with greater work experience perceive risk management practices (RMP) more positively than those with less work experience.
- H₂₁: The perception of credit risk management practices (CRM) varies significantly among bank officers across selected banks.
- H₂₂: Male bank officers perceive credit risk management practices (CRM) more positively than female bank officers.
- H₂₃: Bank officers with greater work experience perceive credit risk management practices (CRM) more positively than those with less work experience.

3.7 Conclusion

This chapter has outlined the research methodology deployed to investigate credit risk management practices among selected banks in Mizoram, emphasizing a mixed-methods framework that combines quantitative and qualitative dimensions. Secondary data from annual reports and primary data gathered through a structured questionnaire form the evidentiary backbone, targeting three key institutions: State Bank of India, Mizoram Rural Bank, and Mizoram Cooperative Apex Bank. The methodology incorporates an array of statistical techniques—descriptive statistics, inferential regression analysis, and correlation assessments—tailored to the study's objectives. Validity and reliability are safeguarded through rigorous measures, including multicollinearity diagnostics and Cronbach's alpha testing. This methodological framework establishes a sturdy platform for analyzing the research

questions, facilitating robust conclusions and actionable recommendations. Subsequent chapters will present the empirical findings, interpret their significance, and discuss their implications for banking practice and policy in Mizoram.

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CHAPTER -4

RISK MANAGEMENT PRACTICES AMONG BANKS IN MIZORAM

This chapter presents the analysis and interpretation of data collected to address the research objectives concerning risk management practices among selected banks in Mizoram. The study aimed at achieving five different objectives. The first two objectives examined the determinants of credit risk and its impact on bank profitability using econometric techniques, focusing on the quantitative analysis of secondary data spanning 2012-13 to 2020-21. The remaining three objectives delve into the analysis of primary data gathered through a structured questionnaire in 2024-25, exploring bank officers' perceptions and practices related to risk management. By employing a mixed-methods approach, this chapter integrates statistical rigor with perceptual insights to provide a comprehensive understanding of risk dynamics and their implications for banking performance in Mizoram. The results are interpreted in light of the theoretical framework and hypotheses proposed earlier, offering a foundation for drawing meaningful conclusions and informing policy and practice.

4.1 Analysis of Secondary Data

This section presents the empirical analysis of the study, focusing on the determinants of credit risk and its impact on bank profitability in Mizoram. This section addresses the first two objectives of the research, examining the factors influencing credit risk and the extent to which credit risk affects the profitability of banks operating in Mizoram. Using secondary data collected from the annual reports of State Bank of India, Mizoram Rural Bank, and Mizoram Cooperative Apex Bank, spanning nine years (2012-13 to 2020-21), this section employs regression analysis to identify the significant determinants of credit risk. Additionally, the section investigates the relationship between credit risk and profitability, providing insights into the potential consequences of credit risk exposure on bank performance.

The findings not only contribute to the broader literature on credit risk and profitability but also provide practical implications for stakeholders in Mizoram's

banking sector. Policymakers can leverage these insights to refine regulatory frameworks, regulators can enhance oversight mechanisms, and banking professionals can adopt strategies to mitigate risk while optimizing profitability, ultimately fostering a more resilient financial ecosystem in the state.

4.2 Bank Specific Variables

This section examines the bank-specific factors that influence the credit risk management practices of the selected banks in Mizoram. Understanding these variables is crucial in assessing the banks' ability to manage credit risk and maintain profitability.

4.2.1 Analysis of Capital to Risk (Weighted) Assets Ratio (CRAR)

A financial indicator called CRAR assesses a bank's financial health and capacity to withstand possible losses. It shows how much a bank's capital, which includes reserves and equity, is in relation to its risk-weighted assets. CRAR is a critical measure of a bank's stability and ability to withstand financial shocks. CRAR is a crucial financial metric that represents the proportion of a bank's capital to its risk weighted assets. The Basel III norms stipulated a capital to risk weighted assets of 8%. However, as per RBI norms, Indian scheduled commercial banks are required to maintain a CRAR of 9% while Indian public sector banks emphasized to maintain a CRAR of 12% (Srinivasan and Britto, 2017). However, our selected banks have maintained an overall CRAR which is well above the regulatory norms of Basel III and RBI, but the latest data shows that the CRAR of MRB is lower than that emphasized by the public sector banks (see Table 4.1).

Table 4.1: Capital to Risk (Weighted) Assets Ratio of the Selected Banks

Year	SBI	MRB	MCAB
2013	12.92	7.92	5.12
2014	12.3	10.08	7.19
2015	12	10.84	8
2016	13.12	11.05	9.18

2017	13.11	11.55	9.94
2018	12.6	11.63	10.91
2019	12.72	10.95	12.5
2020	13.06	9.8	14.2
2021	13.74	9.48	16.13
μ	12.84	10.3667	10.3522

Source: Annual Reports of the Banks

Table 4.1 presents the CRAR of the three selected banks: SBI, MRB and MCAB, over the course of nine years from 2013 to 2021. CRAR indicates the ability of banks to absorb risk. All the banks show a variation in their CRAR over the years, however exhibits a comparable level. The CRAR for all banks varies annually, reflecting changes in the capital structure and risk exposure. It is important to note that MCAB exhibits an increasing trend, from 5.12% in 2013 to 16.13% in 2021, suggesting a significant improvement in capital adequacy over the period. However, MRB's ratio ranges from 7.92% in 2013 to 9.48% in 2021, indicating some fluctuation but generally maintaining a reasonable level. SBI has a relatively stable and increasing CRAR over the years. The upward trend in CRAR for most banks suggests a strengthened financial position.

4.2.2 Analysis of Credit Deposit Ratio (CDR)

The Credit-Deposit Ratio (CDR) is a vital financial metric that evaluates a bank's lending activities relative to its deposit base within a specific timeframe, expressed as a percentage. It measures the proportion of a bank's total loans or credit extended to customers compared to its total deposits, offering insights into the bank's lending strategy and its reliance on customer deposits to fund its lending operations. CDR serves as a key indicator of how much of a bank's deposit pool is utilized for loan disbursements, calculated by dividing the total credit (loans) extended by the total deposits. In India, the CDR for Scheduled Commercial Banks reached 80.78% as of January 24, 2025, up from 80.36% earlier in the month, marking a historical

high since 2005, indicating stronger credit growth compared to deposit growth and raising concerns about liquidity and credit risks for banks (Sarkar, 2025).

$$CDR = \frac{Total\ Credit}{Total\ Deposit}$$

Table 4.2 shows the Credit Deposit Ratio (CDR) of the three selected banks over the period 2013-2021.

Table 4.2: Credit Deposit Ratio of the Selected Banks

Year	SBI	MRB	MCAB
2013	34.60	48.03	67.13
2014	34.80	47.25	68.82
2015	35.10	50.66	70.76
2016	35.56	57.04	67.63
2017	30.89	52.31	58.43
2018	30.36	50.71	54.18
2019	29.41	47.44	58.59
2020	31.22	44.15	63.9
2021	35.77	49.39	61.46
μ	33.08	49.66444	63.43333

Source: Annual Reports of the banks

The CDR for all banks varies annually, reflecting changes in lending and deposit activities. In 2013, SBI had a CDR of 34.60%, MRB stood at 48.03%, and MCAB at 67.13%. SBI's CDR was 34.60% in 2013, MRB's was 48.03%, and MCAB's was 67.13%. The CDR figures for every bank fluctuated during subsequent years. Remarkably, SBI had a decrease in 2017 and 2018 and then an increase in 2021, hitting 35.77%. The trends for MRB and MCAB were different; MRB peaked in 2016 at 57.04%, while MCAB peaked in 2015 at 70.76%. For SBI, MRB, and MCAB, the average CDR throughout the whole period is roughly 33.08%, 49.66%, and 63.43%, respectively. These numbers show how much each bank lends in

relation to the size of its deposit base; MCAB consistently has a larger CDR than the other two banks.

4.2.3 Analysis of Non-Performing Assets (NPA)

Non-Performing Assets (NPAs) represent the portion of a bank's loans or assets that cease to generate income due to borrowers defaulting on payments or the assets becoming worthless. NPAs serve as a critical financial indicator, highlighting the effectiveness of a bank's lending policies and the quality of its loan portfolio. Essentially, NPAs are loans or advances held by a bank or financial institution that no longer earn interest, reflecting potential losses from unrecoverable debts. Net Non-Performing Assets (Net NPAs) measure the portion of these loans not expected to be recovered after accounting for provisions set aside by the bank. In India, the Net NPA ratio for Scheduled Commercial Banks (SCBs) declined significantly, reaching a decade-low of 0.6% by March 2024, driven by improved asset quality, higher write-offs, and steady credit demand (Reserve Bank of India, 2024). Globally, India's Net NPA ratio of 0.6% in 2024 compares favourably to countries like Ukraine (30.3%), Greece (31.9%), and Bangladesh (16.9%), indicating a relatively healthier banking sector (indi_statistics, 2025). Table 4.3 illustrates the Net Non-Performing Assets (NPAs) of three selected banks from 2013 to 2021, underscoring the importance of monitoring this metric to assess financial stability.

Table 4.3: Non-Performing Assets of the Selected Banks

Year	SBI	MRB	MCAB
2013	5	4.57	10.9
2014	6	3.43	11.98
2015	5	2.68	11.85
2016	7	3.44	8.34
2017	7	3.79	7.73
2018	8	3.94	7.17
2019	8	2.05	6.57
2020	6	1.41	3.69

2021	7	2.45	2.18
μ	6.56	3.084444	7.823333

Source: Annual Reports of the Banks and SLBC Data

In 2013, SBI's net NPA stood at 5%, MRB at 4.57%, and MCAB at 10.9%. Over the subsequent years, the net NPA figures fluctuated for each bank. SBI's net NPA peaked in 2018 at 8% before decreasing to 6% in 2020 and slightly increasing to 7% in 2021. MRB's net NPA experienced a decline from 2013 to 2019, reaching its lowest point at 2.05% in 2019, and then increased to 2.45% in 2021. MCAB showed a declining trend, with net NPA decreasing to 2.18% in 2021.

The average net NPA for the entire period is approximately 6.56% for SBI, 3.08% for MRB, and 7.82% for MCAB. These figures provide insights into the asset quality and risk management of each bank, with a lower net NPA indicating a healthier loan portfolio. The information is sourced from the annual reports of the respective banks and SLBC (State Level Bankers' Committee) data, offering a comprehensive overview of the banks' financial health and management of non-performing assets.

4.2.4 Analysis of Credit Growth

Credit growth represents the rise in the volume of loans and advances extended by banks and financial institutions to individuals, businesses, and governments, serving as a key indicator of economic activity. It reflects both the demand for credit and the willingness of lenders to supply it, signaling economic expansion or contraction. In India, credit growth for Scheduled Commercial Banks reached 15.4% year-on-year as of January 24, 2025, outpacing deposit growth at 11.3%, driven by strong demand across retail, corporate, and agricultural sectors (Sarkar, 2025). Globally, credit growth varies, with emerging economies like India and China (around 10-15% annually) often outpacing advanced economies like the US and Eurozone (typically 3-7%), reflecting differences in economic cycles and monetary policies (World Bank, 2024).

$$\text{Credit Growth} = \frac{(\text{Current Period Credit} - \text{Previous Period Credit})}{\text{Previous Period Credit}} \times 100$$

Where:

Current Period Credit = Total credit outstanding at the end of the current period (e.g. quarter or year)

Previous Period Credit = Total credit outstanding at the end of the previous period

Table 4.4 presents the credit growth of the selected banks, namely State Bank of India (SBI), Mizoram Rural Bank (MRB), and Mizoram Cooperative Apex Bank (MCAB), over the period of 2013-2021.

Table 4.4: Credit Growth of the Selected Banks

Year	SBI	MRB	MCAB
2013	7.2	36.47	22.38
2014	6.1	15.25	17.64
2015	7.8	19.28	7.23
2016	6.8	14.48	9.41
2017	6.39	10.29	5.67
2018	10.82	14.15	11.73
2019	10.04	13.31	19.70
2020	15.32	59.97	40.13
2021	21.43	38.91	6.63
μ	10.21111	24.67889	15.61281

Source: Annual Reports of the Banks

The data reveals varying trends in credit growth across the banks. Notably, MRB exhibited the highest credit growth in 2020 (59.97%) and consistently outperformed SBI and MCAB in terms of credit growth until 2020. However, in 2021, SBI surpassed MRB with a credit growth rate of 21.43%. MCAB's credit growth fluctuated significantly over the years, with a remarkable increase in 2020 (40.13%) followed by a sharp decline in 2021 (6.63%). The overall average credit growth rates for SBI, MRB, and MCAB were 10.21%, 24.68%, and 15.61%, respectively.

4.2.5 Analysis of Return on Assets (ROA)

Return on Assets (ROA) is a key financial ratio that gauges how efficiently a bank utilizes its assets to generate profits, expressed as a percentage. It measures the proportion of a bank's net income relative to its total assets, providing insight into the effectiveness of management in converting assets into earnings. A higher ROA indicates better asset utilization and profitability. ROA is calculated by dividing net income by total assets. In India, the ROA for Scheduled Commercial Banks improved to 1.3% in FY 2023-24, reflecting enhanced profitability and asset quality (Reserve Bank of India, 2024). Globally, ROA varies, with major US banks averaging around 0.9-1.2% in 2024, while European banks typically range from 0.5-0.8%, influenced by economic conditions and regulatory frameworks (International Monetary Fund, 2024).

$$\text{Return on Assets} = \frac{\text{Net Income}}{\text{Total Assets}}$$

Table 4.5 presents the Return on Assets (ROA) of Mizoram Rural Bank (MRB) and Mizoram Cooperative Apex Bank (MCAB) from 2013 to 2021.

Table 4.5: Return on Assets of the Selected Banks

Year	MRB	MCAB
2013	0.995002	0.578669
2014	1.157931	0.712916
2015	1.29685	0.660185
2016	0.936833	0.929073
2017	1.03897	0.786077
2018	0.945457	0.656817
2019	0.300364	0.879519
2020	0.371292	0.984745
2021	0.849738	1.349519
Mean (μ)	0.876937	0.837502

Source: Annual Reports of the Banks

The ROA, a key measure of profitability relative to total assets, fluctuated for both banks over the period. MRB's ROA ranged from 0.300364 in 2019 to 1.29685 in 2015, with a mean ROA of 0.876937. Similarly, MCAB's ROA varied between 0.578669 in 2013 and 1.349519 in 2021, with a mean ROA of 0.837502. Notably, both banks demonstrated comparable profitability, with MCAB's ROA surpassing MRB's in 2021, indicating improved asset utilization. Overall, the data suggests that while both banks experienced variability in ROA, they maintained relatively stable profitability over the nine-year period.

4.2.6 Analysis of Return on Equity (ROE)

Return on Equity (ROE) is a critical financial performance metric that measures the profits a bank generates from its shareholders' equity over a specific period, expressed as a percentage. It highlights the efficiency with which a bank utilizes shareholders' equity to produce earnings, serving as a key indicator of management's effectiveness in leveraging investor capital for profit generation. ROE is calculated by dividing net income by total shareholders' equity. In India, the ROE for Scheduled Commercial Banks reached 13.5% in FY 2023-24, reflecting improved profitability driven by strong credit growth and declining non-performing assets (Reserve Bank of India, 2024). Globally, ROE varies, with US banks averaging 10-12% in 2024, while European banks typically range from 6-8%, influenced by economic conditions and regulatory environments (International Monetary Fund, 2024). Table 4.6 illustrates the Return on Equity (ROE) of Mizoram Rural Bank (MRB) and Mizoram Cooperative Apex Bank (MCAB) from 2013 to 2021, underscoring the importance of this metric in assessing financial performance.

Table 4.6: Return on Equity of the Selected Banks

Year	MRB	MCAB
2013	43.62887	26.30365
2014	33.31263	25.15768
2015	27.04191	19.92313
2016	16.64804	26.21514

2017	17.68435	21.89186
2018	16.42031	18.13148
2019	5.620453	23.36519
2020	8.285111	25.73513
2021	20.65495	33.73076
Mean	21.03296	24.49489

Source: Computed from the Annual Reports of the Banks

The ROE, a measure of profitability relative to shareholder equity, exhibited fluctuations for both banks. MRB's ROE ranged from 5.620453 in 2019 to 43.62887 in 2013, with a mean ROE of 21.03296. MCAB's ROE varied between 18.13148 in 2018 and 33.73076 in 2021, with a mean ROE of 24.49489. Notably, MCAB maintained a relatively higher mean ROE compared to MRB, indicating better utilization of shareholder equity. While both banks experienced variability in ROE, MCAB demonstrated greater consistency, with most years exceeding 20%.

4.3 Macroeconomic Variables

It is crucial to emphasize that, because our research is limited to the banks of a particular state, that is, Mizoram, the macro-economic variables are uniform across the different individual banks for any given time period.

4.3.1 Analysis of Gross State Domestic Product (GSDP)

Gross State Domestic Product (GSDP) represents the total monetary value of all goods and services produced within a state's geographical boundaries over a specified period, serving as a key indicator of a state's economic activity and growth. It is categorized into three sectors: the primary sector (agriculture, forestry, fishing, and mining), the secondary sector (manufacturing, construction, and utilities), and the tertiary sector (services, trade, transport, and tourism). In India, for the fiscal year 2024-25, Maharashtra leads with the highest projected GSDP at approximately ₹43.43 lakh crore, followed by Tamil Nadu at ₹31.42 lakh crore, reflecting significant contributions from the tertiary sector in both states (Ministry of Statistics and Programme Implementation, 2025). However, regional disparities are stark, with

southern and western states like Maharashtra, Tamil Nadu, Karnataka (₹28.09 lakh crore), and Gujarat (₹27.90 lakh crore) dominating economic output, while northeastern states such as Mizoram, Manipur, and Nagaland have significantly smaller GSDPs, contributing only 3.04% collectively to India's economy (StatisticsTimes.com, 2025). These disparities highlight uneven industrialization, infrastructure development, and access to resources, with states like Bihar (GSDP ₹9.76 lakh crore) and Uttar Pradesh (₹24.99 lakh crore) lagging despite large populations, underscoring the need for targeted policy interventions to address regional economic imbalances (Forbes India, 2024). It is calculated using the formula:

$$\text{GSDP} = \text{Value of Goods and Services Produced} + \text{Taxes on Goods and Services} - \text{Subsidies on Goods and Services}$$

Table 4.7 presents the Gross State Domestic Product (GSDP) growth rate of Mizoram from 2013 to 2021.

Table 4.7: Gross State Domestic Product(GSDP) of Mizoram

Year	Percentage of GSDP
2013	7.15
2014	11.59
2015	15.76
2016	14.15
2017	13.37
2018	12.44
2019	11.99
2020	12.25
2021	12.95
Mean	12.40556

Source: Directorate of Economic and Statistics, Government of Mizoram

The data reveals a significant fluctuation in GSDP growth, ranging from 7.15% in 2013 to 15.76% in 2015. Although the growth rate declined thereafter, it stabilized around 12% from 2017 onwards. The mean GSDP growth rate over the

nine-year period was 12.41%. This suggests that Mizoram's economy experienced moderate growth during this period, with some variability.

4.3.2 Analysis of Inflation

Inflation refers to the sustained rise in the general price level of goods and services in an economy over time, typically measured as an annual percentage increase in the Consumer Price Index (CPI), which tracks the cost of a representative basket of household goods and services. In India, the CPI inflation rate eased to 5.49% in September 2024, driven by moderating food prices, though still above the Reserve Bank of India's target of 4% (Reserve Bank of India, 2024). Significant regional disparities exist within India, with rural areas often experiencing higher inflation rates (e.g., 5.8% in September 2024) compared to urban areas (5.1%), reflecting differences in consumption patterns, transportation costs, and access to markets (Ministry of Statistics and Programme Implementation, 2024). Table 4.8 presents the average inflation rate in Mizoram from 2013 to 2021.

Table 4.8: Average Inflation Rate in Mizoram

Year	Inflation
2013	9
2014	8.4
2015	3.6
2016	3.4
2017	1.2
2018	3
2019	3.6
2020	7.6
2021	5.6
Mean	5.04

Source: Directorate of Economic and Statistics, Government of Mizoram

The data indicates significant fluctuations in inflation rates over the period. Inflation peaked at 9% in 2013 and declined steadily to 1.2% in 2017, suggesting effective monetary and fiscal policies. However, inflation rates increased thereafter, reaching 7.6% in 2020, potentially due to external factors such as global economic trends or supply chain disruptions. The mean inflation rate over the nine-year period was 5.04%. Notably, the inflation rate stabilized at 5.6% in 2021, suggesting a return to moderate levels.

4.4 Analysis of the Determinant of Credit Risk in Mizoram.

The present section attempts to evaluate the determinants of banks' credit risk in Mizoram. Our sample consists of a balanced panel of three public sector banks—the State Bank of India (SBI), the Mizoram Rural Bank (MRB), and the Mizoram Cooperative Apex Bank (MCAB)—from their operations within Mizoram. The three selected banks are fairly homogeneous in their management philosophy and operate in the same (regulatory) environment. The period of analysis consists of 9 years from 2012-13 to 2020-21. We have a balanced panel of 27 observations.

Based on the readings of existing literature, we use the ratio of NPA to total advances as proxy for credit risk and as a dependent variable. The following bank-specific variables and macro-economic are used as explanatory (independent) variables for our study.

Bank Specific Variables:

- i. CRAR = Capital to Risk (Weighted) Assets Ratio
- ii. CG = Credit Growth
- iii. CDR = Credit Deposit Ratio

Macroeconomic Variables:

- i. GSDP = Economic growth (GSDP)
- ii. INF = Inflation (CPI)

To guide our empirical analysis, we propose the following hypotheses based on prior literature and the context of banking in Mizoram:

- H₁** : There is a negative relationship between Capital Adequacy Ratio (CRAR) and Non-Performing Assets (NPA).
- H₂** : There is a positive relationship between Credit Growth (CG) and Non-Performing Assets (NPA).
- H₃** : There is a positive relationship between Credit Deposit Ratio (CDR) and Non-Performing Assets (NPA).
- H₄** : There is a negative relationship between Economic Growth (GDP) and Non-Performing Assets (NPA).
- H₅** : There is a positive relationship between Inflation (INF) and Non-Performing Assets (NPA).

4.4.1 Econometric Model

Owing to the panel nature of the dataset, which includes both cross-sectional and time series dimensions, we use the Fixed Effect Least-Squares Dummy Variable (LSDV) model as discussed by Gujarati and Porter (2009b) for our econometric analysis. Employing a panel regression approach can help estimate unobserved entity-specific and time-specific effects that are difficult to get using a pure time-series or cross-sectional regression. LSDV uses dummy variables to estimate entity-specific effects. This is demonstrated by Equation (1), which describes the LSDV model with entity-specific effects but without time effects.

$$NPA_{it} = \beta_0 + \beta_1 D_{2i} + \beta_2 D_{3i} + \beta_4 CRAR_{it} + \beta_5 CG_{it} + \beta_6 CDR_{it} + \beta_7 GSDP_{it} + \beta_8 INF_{it} + u_{it} \dots\dots\dots (1)$$

where i is the i^{th} subject and t is the time period for the aforementioned variables;

$D_{2i} = 1$ for Bank 2, 0 otherwise; $D_{3i} = 1$ for Bank 3, 0 otherwise; we have three category; we have introduced only two dummy variables to avoid falling into the dummy-variable trap.

4.4.2 Descriptive Statistic

Descriptive statistics is a statistical approach that focuses on summarizing and characterizing the key aspects of a dataset, offering a compact overview of the

data through metrics such as central tendency, variability, and distribution shape. Table 4.9 reports the descriptive statistics of the sample data set.

Table 4.9: Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
NPA	27	1.41	11.98	5.8211	2.91446
CRAR	27	5.12	16.13	11.1867	2.38429
CG	27	5.67	59.97	16.8344	13.00850
CDR	27	29.41	70.76	48.7256	13.25728
INF	27	1.20	9.00	5.0444	2.62200
GSDP	27	7.15	15.76	12.4056	2.25336
Valid N (listwise)	27				

Source: Researchers' Compilation

Table 4.9 gives an overall description of data used in the analysis. All the variables have 27 observations which indicate that the data is a balanced panel data. The NPA mean and CDR mean are 5.8211 and 48.7256 respectively, which is lower than the national level. As per RBI data, all India Gross NPA stood at 7.3% while CDR was 72.1 per cent during March, 2022. So, banks limit their credit disbursal which results in a relatively lower NPA. As per the regulatory requirement of BASEL III norms, banks in India are required to maintain a minimum Capital to Risk Weighted Assets Ratio (CRAR) of 9 per cent on an ongoing basis (RBI, 2022). However, our selected banks have maintained CRAR (11.1867) which is well above the regulatory norms (see Table 4.9).

4.4.3 Model summary

Table 4.10 shows the model summary in which the value of R-square (0.921) indicates that independent variable predicts the dependent variable (NPA) to the level of 92.1 percent. ANOVA result shows that there is a significant impact of the explanatory variables on the dependent variables.

Table 4.10: Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	ANOVA	
				F	Sig
.960	.921	.889	.87285	28.498343	0.000000

Source: Researchers' Compilation

4.4.4 Regression Analysis

We employed the Fixed Effects Least-Squares Dummy Variable (LSDV) model to estimate the regression coefficients, thereby accounting for individual-specific heterogeneity and time-invariant effects. This approach enabled us to control for unobserved factors that may influence the dependent variable. Results of the regression are displayed in Table 4.11.

Table 4.11: Fixed Effects Least-Squares Dummy Variable

Variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	34.274	10.661		3.215	.005
CRAR	-.784	.094	-.709	-8.346	.000
IDF_CG	.158	.098	.138	1.608	.126
IDF_CDR	.509	.224	.459	2.274	.036
IDF_INF	-2.800	.617	-.533	-4.541	.000
IDF_GSDP	-2.366	.733	-.365	-3.230	.005
Dummy_1	-6.977	.781	-1.267	-8.934	.000
Dummy_2	-3.964	1.231	-.720	-3.220	.005

Dependent Variable: NPA

Source: Researchers' Compilation

Table 4.11 presents the results of a Fixed Effect Least-Squares Dummy Variable (LSDV) model examining the impact of Capital to Risk-Weighted Assets Ratio (CRAR), Credit Growth (IDF_CG), Credit-Deposit Ratio (IDF_CDR), Inflation (IDF_INF), and Gross State Domestic Product (IDF_GSDP) on Non-

Performing Assets (NPA), with two dummy variables (Dummy_1 and Dummy_2) controlling for fixed effects. The model uses unstandardized and standardized coefficients, t-statistics, and p-values to assess the significance of each predictor.

H₁: There is a negative relationship between Capital Adequacy Ratio (CRAR) and Non-Performing Assets (NPA).

The Hypothesis (H₁) suggested that a higher Capital to Risk-Weighted Assets Ratio (CRAR), which measures a bank's capital adequacy and ability to absorb losses, is associated with lower Non-Performing Assets (NPA), as stronger capital buffers may enhance risk management and reduce loan defaults. Table 4.10 shows the coefficient for CRAR is -0.784 (standardized beta = -0.709), with a standard error of 0.094, t-statistic of -8.346, and p-value of 0.000. The negative coefficient indicates that an increase in CRAR is associated with a decrease in NPA, consistent with the hypothesized direction. The p-value (0.000) is well below the conventional significance threshold of 0.05, confirming that the relationship is statistically significant. The standardized beta (-0.709) suggests a strong negative effect, implying that CRAR is a substantial predictor of NPA. This finding aligns with expectations that higher capital adequacy strengthens banks' resilience, reducing the likelihood of non-performing loans (Saunders & Cornett, 2017). The significant t-statistic (-8.346) further supports the robustness of this relationship. Thus, the null hypothesis is rejected and the alternative hypothesis H₁ is failed to be rejected, as there is a statistically significant negative relationship between CRAR and NPA (coefficient = -0.784, p = 0.000), indicating that higher capital adequacy is associated with lower NPA levels.

H₂: There is a positive relationship between Credit Growth (CG) and Non-Performing Assets (NPA).

Hypothesis (H₂) suggests that stronger Credit Growth (CG), represented by IDF_CG, is associated with higher Non-Performing Assets (NPA). The coefficient for IDF_CG is 0.158 (standardized beta = 0.138), with a standard error of 0.098, t-statistic of 1.608, and p-value of 0.126. The positive coefficient aligns with the

hypothesized direction, suggesting that an increase in Credit Growth is associated with a slight increase in NPA. However, the p-value (0.126) exceeds the 0.05 significance threshold, indicating that the relationship is not statistically significant. The standardized beta (0.138) suggests a weak effect, and the t-statistic (1.608) is not sufficiently large to reject the null hypothesis of no relationship. This finding implies that Credit Growth, as measured by IDF_CG, does not have a significant impact on NPA in this model, contrary to the hypothesis. The lack of significance may reflect measurement issues with IDF_CG or contextual factors in Mizoram's banking sector, where governance practices may not strongly influence NPA levels. Thus, the null hypothesis is failed to be rejected and the alternative hypothesis H_2 is rejected, as the positive relationship between CG (IDF_CG) and NPA is not statistically significant (coefficient = 0.158, $p = 0.126$), suggesting that Credit Growth does not significantly affect NPA levels in this sample.

H₃: There is a positive relationship between Credit Deposit Ratio (CDR) and Non-Performing Assets (NPA).

H_3 proposes that a higher Credit-Deposit Ratio (CDR), represented by IDF_CDR, which indicates a greater proportion of deposits lent out as credit, is associated with increased Non-Performing Assets (NPA), as aggressive lending may elevate default risks. The coefficient for IDF_CDR is 0.509 (standardized beta = 0.459), with a standard error of 0.224, t-statistic of 2.274, and p-value of 0.036. The positive coefficient supports the hypothesized direction, indicating that an increase in CDR is associated with higher NPA levels. The p-value (0.036) is below 0.05, confirming statistical significance. The standardized beta (0.459) suggests a moderate effect, indicating that CDR is a meaningful predictor of NPA. The significant t-statistic (2.274) reinforces the reliability of this relationship. This finding is consistent with the literature, which suggests that higher lending activity, as reflected by CDR, can increase credit risk and lead to more non-performing loans if not managed carefully (Mishra & Prakash, 2018). Thus, the null hypothesis is rejected and the alternative hypothesis H_3 is failed to be rejected, as there is a statistically significant positive relationship between CDR (IDF_CDR) and NPA.

(coefficient = 0.509, $p = 0.036$), indicating that higher credit-deposit ratios are associated with increased NPA levels.

H₄: There is a negative relationship between Economic Growth (GDP) and Non-Performing Assets (NPA).

Hypothesis (H₄) asserts that higher Gross State Domestic Product (GSDP), represented by IDF_GSDP, is associated with lower Non-Performing Assets (NPA), as economic growth improves borrowers' repayment capacity, reducing loan defaults. The coefficient for IDF_GSDP is -2.366 (standardized beta = -0.365), with a standard error of 0.733, t-statistic of -3.230, and p-value of 0.005. The negative coefficient aligns with the hypothesized direction, indicating that an increase in GSDP is associated with a decrease in NPA. The p-value (0.005) is well below 0.05, confirming statistical significance. The standardized beta (-0.365) suggests a moderate negative effect, indicating that economic growth, as measured by GSDP, has a notable impact on reducing NPA. The significant t-statistic (-3.230) supports the robustness of this relationship. This finding is consistent with economic theory, which posits that stronger economic conditions reduce financial distress among borrowers, lowering NPA levels (Saunders & Cornett, 2017). Therefore, the null hypothesis is rejected and the alternative hypothesis H₄ is failed to be rejected, as there is a statistically significant negative relationship between GDP (IDF_GSDP) and NPA (coefficient = -2.366, $p = 0.005$), indicating that higher economic growth is associated with lower NPA levels.

H₅: There is a positive relationship between Inflation (INF) and Non-Performing Assets (NPA).

Hypothesis (H₅) proposes that higher Inflation (INF), represented by IDF_INF, is associated with increased Non-Performing Assets (NPA), as inflation may erode borrowers' real income, increasing default risks. The coefficient for IDF_INF is -2.800 (standardized beta = -0.533), with a standard error of 0.617, t-statistic of -4.541, and p-value of 0.000. The negative coefficient contradicts the hypothesized positive relationship, indicating that an increase in inflation is associated with a decrease in NPA, which is counterintuitive. The p-value (0.000) confirms that this

relationship is highly significant, and the standardized beta (-0.533) suggests a strong effect. The significant t-statistic (-4.541) reinforces the reliability of this finding. This unexpected negative relationship may reflect specific dynamics in Mizoram's banking sector, such as banks' ability to adjust lending practices during inflationary periods or borrowers' resilience to inflation. Alternatively, it could indicate multicollinearity or model specification issues, as inflation typically increases credit risk (Mishra & Prakash, 2018). The contradiction with H_{1c} suggests that inflation does not contribute to higher NPA in this context. Thus, the null hypothesis is failed to be rejected and the alternative hypothesis H_5 is rejected, as the relationship between INF (IDF_INF) and NPA is significantly negative (coefficient = -2.800, $p = 0.000$), contrary to the hypothesized positive relationship, indicating that higher inflation is associated with lower NPA levels.

4.5 Analysis of Data to Study the Effect of Credit Risk on Profitability

This section evaluates the effect of credit risk towards bank's profitability in Mizoram. The study employed a cross-sectional design, focusing on selected banks operating in Mizoram. Bank-specific data were collected from the annual report of the chosen banks spanning the period from 2013 to 2021. Mizoram houses a total of 24 banks, comprising 12 nationalized commercial banks, 10 private banks, one rural bank, and one cooperative bank, collectively operating across the state's 239 branches. Mizoram Rural Bank and Mizoram Apex Bank were specifically chosen for this study due to their exclusive operations limited to the state of Mizoram. The remaining banks were not considered in this analysis. Out of the total 239 bank branches in Mizoram, the selected banks, Mizoram Rural Bank and Mizoram Apex Bank, operate 124 branches, which represent 51.88% of the total bank branches operating in the state. To guide our empirical analysis, we propose the following hypotheses based on prior literature and the context of banking in Mizoram:

H_6 : *There is a negative relationship between Return on Assets (ROA) and Non-Performing Assets (NPA).*

H_7 : *There is a negative relationship between Return on Equity (ROE) and Non-Performing Assets (NPA).*

H₈ : There is a negative relationship between Return on Assets (ROA) and Capital Adequacy Ratio (CRAR).

H₉ : There is a negative relationship between Return on Equity (ROE) and Capital Adequacy Ratio (CRAR).

H₁₀ : There is a negative relationship between Return on Assets (ROA) and Credit Deposit Ratio (CDR).

H₁₁ : There is a negative relationship between Return on Equity (ROE) and Credit Deposit Ratio (CDR).

4.5.1 Econometric Model

To investigate the relationship between credit risk and bank profitability, a quantitative research design was chosen. The study employed a cross-sectional design, focusing on studied banks operating in Mizoram. As SBI does not prepare final accounts based on its operations within Mizoram, their ROA and ROE calculated from within Mizoram were not available. Hence, only two banks MRB and MCAB were included in the analysis for this objective. However, running a panel data with only two groups can restrict the ability of panel model like Generalized Least Square (GLS) to reliably estimate group-specific effects. So, in a very few groups, GLS may fail to detect heterogeneity. Running both Ordinary Least Square (OLS) and GLS together confirms efficiency by comparing their results. Thus, we are employing both models to ensure robustness and verify whether panel effects justify GLS over OLS.

The impact of credit risk on profitability of the selected banks in Mizoram will be analyzed using the following basic panel linear regression model:

$$Y_{it} = c + \sum \beta_i X_{it} + \varepsilon_{it} \dots \dots \dots (2)$$

Where i indicates the i^{th} bank and t indicates time period. The dependent variable Y is the profitability of the banks. The explanatory variables are indicated by X in the regression equation. In addition, c is constant and β is the coefficient of the regressors. Finally ε is the error term or disturbances.

4.5.2 Descriptive Statistic

Table 4.12 presents the descriptive statistics for the selected variables, which include three indicators of credit risk (NPA, CRAR, and CDR) and two profitability ratios (ROA and ROE).

Table 4.12: Descriptive Statistics of Variables Indicating Profitability and Credit Risk

Variables	N	Minimum	Maximum	Mean	Std. Deviation
NPA	18	.50	10.90	4.6905	2.99920
CRAR	18	5.12	21.88	10.9940	3.51545
CDR	18	44.15	70.76	57.3990	8.59887
ROA	18	.30	1.77	.9088	.33488
ROE	18	5.62	43.63	23.4075	9.07188
Valid N (listwise)	18				

Source: Researchers' Compilation

The NPA of the selected banks ranges from 0.50% to 10.90%, with a mean of 4.6905 and a standard deviation of 2.99920. This indicates a high level of volatility among banks in managing credit risk during the analyzed period. Regarding capital adequacy, the selected banks' CRAR ranges from 5.12% to 21.88%, with a mean of 10.9940 and a standard deviation of 3.51545. This suggests significant variation in CRAR among the banks during the studied period. CDR is a financial metric that measures the proportion of a bank's loans or credit extended to borrowers compared to the total deposits it holds. The CDR of the selected banks has a mean and standard deviation of 57.3990 and 8.59887. A high CDR indicates that a significant portion of the bank's deposits is being lent out as credit, which might signify an active lending strategy but could also raise concerns about the bank's liquidity. On the other hand, a low CDR suggests that the bank is maintaining a larger portion of its deposits in a liquid form and might be more risk-averse in terms of lending. The mean and standard deviation of ROA are 0.9088 and 0.33488, respectively, indicating that the banks are actively competing to generate profits, and their profit-making capacities

are not significantly divergent from each other. Similarly, the mean and standard deviation of ROE are 23.4075 and 9.07188 respectively.

4.5.3 Regression Analysis

The data were analyzed using a panel regression model, as described in Equation [2]. The Hausman test is used to compare random effects GLS with fixed effects in panel data models. As determined by the Hausman test, with p-values of 0.5688 for ROA and 0.9956 for ROE, both exceeded 0.05, supporting the null hypothesis. Therefore, GLS random effect was chosen. Table 4.13 presents OLS and GLS outputs, demonstrating the impact of credit risk on bank profitability, with GLS employed for robustness.

Table 4.13: OLS and GLS Output Showing the Effect of Credit Risk on Bank's Profitability

Variable	ROA				ROE			
	Coeff. OLS	P- value OLS	Coeff. GLS	P-value GLS	Coeff. OLS	P-value OLS	Coeff. GLS	P-value GLS
NPA	- 0.0206	0.599	-0.0206	0.591	- 0.0561	0.968	- 0.0561	0.967
Log_CR AR	1.3218	0.096	1.3218	0.077	6.6984	0.803	6.6984	0.8
CDR	0.0127	0.222	0.0127	0.203	0.3248	0.374	0.3248	0.361
Constant	- 1.0789	0.157	-1.0789	0.138	- 1.8231	0.944	- 1.8231	0.944
R²	0.473		0.473		0.101		0.101	
χ²			14.36	0.0025			1.80	0.6156
sigma_u			0				0	
sigma_e			.25704				9.659 3	
Rho			0				0	

Source: Researchers' Compilation

Table 4.13 presents the results of OLS and GLS-random effect models assessing the impact of credit risk variables—CDR, Log_CRAR, and Log_NPA—on bank profitability, measured as ROA and ROE. The analysis is based on a panel of 18 observations, with the Wald chi-square test indicating a good model fit for ROA ($\chi^2 = 14.36$, $p = 0.0025$ in GLS but poor fit for ROE ($\chi^2 = 1.80$, $p = 0.6156$), suggesting limited explanatory power for ROE. This is confirmed by the low R-square for ROE, indicating that only 10.1 percent is explained by the independent variable. The following hypotheses test the expected negative relationships between ROA and ROE and credit risk proxied as NPA, CRAR and CDR.

H₆: There is a negative relationship between Return on Assets (ROA) and Non-Performing Assets (NPA).

The OLS and GLS models show a negative Log_NPA coefficient (-0.0206, $p=0.599$ in OLS; -0.0206, $p=0.591$ in GLS), aligning with the expected direction, but the p-values indicate no statistical significance. The analysis does not support hypothesis H₆, which proposed that higher NPA are associated with lower ROA. NPAs have negligible impact on ROA among banks in Mizoram. Thus, H₆ is rejected.

H₇: There is a negative relationship between Return on Equity (ROE) and Non-Performing Assets (NPA).

The analysis does not support hypothesis H₇, which predicted that higher NPA are associated with lower ROE. Again, the OLS and GLS model indicate a negative coefficient between ROE and ROA (-0.0561). This suggested that as NPA increases, ROE decreases. However, the negative relationship between NPA and ROE is not significant as the p-value is more than 0.05 ($0.967 > 0$). Thus, H₇ is rejected.

H₈: There is a negative relationship between Return on Assets (ROA) and Capital Adequacy Ratio (CRAR).

The literatures have indicated a positive relationship between ROA and CRAR; therefore our hypothesis has predicted a positive relationship between the

two variables. As expected, this analysis using OLS and GLS has indicated a positive relationship. The coefficient between ROA and CRAR in both the model is 1.3218, but the relationship is not statistically significant as the p-value is greater than threshold of 0.05 (0.096 and 0.077 > 0). Thus, H_8 is rejected.

H₉: There is a negative relationship between Return on Equity (ROE) and Capital Adequacy Ratio (CRAR).

Similarly, existing literatures have predicted a positive relationship between ROE and CRAR. The OLS and GLS model shown a positive coefficient (6.6984) in both the model, however, the relationship is not statistically significant (0.803 > 0). Thus, H_9 is rejected.

H₁₀: There is a negative relationship between Return on Assets (ROA) and Credit Deposit Ratio (CDR).

CDR is the amount of credit disbursed by the banks for every deposit they received. Thus, higher CDR indicates higher credit risk. It can be expected that higher CDR would increase profit if credit risk is efficiently managed. The existing literatures have suggested a mixed finding in the relationship with CDR and ROA. As the study is conducted in an area dominated by the priority sector, which are often linked to increased NPA. We expect a negative relationship between CDR and ROA. However, analysis indicated a positive but statistically insignificant coefficient of 0.0127. Thus, H_{10} is rejected.

H₁₁: There is a negative relationship between Return on Equity (ROE) and Credit Deposit Ratio (CDR).

Similarly, the relationship between ROE and CDR is expected to be negative. The OLS and GLS output have indicated a positive but insignificant relationship between ROE and CDR with the coefficient value of 0.3248 and a p-value of 0.374 and 0.361. Thus, H_{11} is rejected.

4.6 Analysis of Primary Data

This section investigates the risk management practices of selected banks in Mizoram, with a focus on the perspectives of bank officers. The banking sector's stability and growth are contingent upon effective risk management, and this study aims to assess the adequacy of current practices. Through a comprehensive analysis of bank officers' perceptions, this chapter evaluates their understanding of risk identification, risk assessment, and risk mitigation strategies. The study also explores the application of risk management techniques and credit risk management practices, including credit appraisal, risk mitigation tools, and credit control and recovery. The findings will contribute to a deeper understanding of Mizoram's banking sector's risk management capabilities and inform strategies for enhancement.

To guide our empirical analysis, we propose the following hypotheses based on prior literature and the context of banking in Mizoram:

- H₁₂: A higher level of understanding of risks and risk management (URRM) among bank officers is positively associated with the adoption and effectiveness of risk management practices (RMP) in banks.*
- H₁₃: Greater availability of resources for risk management (ARRM) in banks is positively associated with the adoption and effectiveness of risk management practices (RMP) in banks.*
- H₁₄: Positive perception of bankers towards credit risk management practices (PBRM) is positively associated with the adoption and effectiveness of overall risk management practices (RPM).*
- H₁₅: Effective risk identification (RI) is positively associated with the implementation and success of risk management practices (RMP).*
- H₁₆: Robust risk analysis and monitoring (RAM) are positively associated with the implementation and effectiveness of risk management practices (RMP)*
- H₁₇: Robust Credit Risk Management (CRM) is positively associated with the implementation and effectiveness of risk management practices (RMP).*

- H₁₈: The perception of risk management practices (RMP) varies significantly among bank officers across selected banks.*
- H₁₉: Male bank officers perceive risk management practices (RMP) more positively than female bank officers.*
- H₂₀: Bank officers with greater work experience perceive risk management practices (RMP) more positively than those with less work experience.*
- H₂₁: The perception of credit risk management practices (CRM) varies significantly among bank officers across selected banks.*
- H₂₂: Male bank officers perceive credit risk management practices (CRM) more positively than female bank officers.*
- H₂₃: Bank officers with greater work experience perceive credit risk management practices (CRM) more positively than those with less work experience.*

4.7 Demographic Profile of the Respondents

In this sub-section, an effort has been undertaken to analyze the details of respondents for the present study. The details include the banks they are affiliated to, gender, work experience, educational level. Table 4.14 presents the demographic characteristics of the respondents:

Table 4.14 : Characteristics of the Respondents

Attributes	Frequency	%
<i>Banks</i>		
State Bank of India	53	33.97
Mizoram Rural Bank	63	40.38
Mizoram Cooperative Apex Bank	40	25.64
<i>Gender</i>		
Male	87	55.77
Female	69	44.23
<i>Duration of experience</i>		
More than 30 years	20	13.46

Between 20 and 30 years	27	17.31
Between 10 and 20 years	49	31.41
Between 5 and 10	29	18.59
Less than five years	30	19.23
<i>Highest Educational Qualification</i>		
Post Graduate	57	36.54
Graduate	93	59.61
Others	6	3.85

Source: Primary Data Analysis

The demographic characteristics of the respondents are presented in Table 4.14. The sample consists of 87 males (55.77%) and 69 females (44.23%), indicating a slightly higher representation of males. The State Bank of India accounts for 33.97% of the officers surveyed, with 53 individuals. Mizoram Rural Bank has the largest share, comprising 40.38% (63 officers). Meanwhile, Mizoram Cooperative Apex Bank includes 25.64% (40 officers). The distribution of bank officers based on their work experience reveals a varied workforce. Among the officers surveyed, 13.46% (20 individuals) have more than 30 years of experience. Those with between 20 and 30 years of experience account for 17.31% (27 officers). The largest segment, comprising 31.41% (49 officers), falls between 10 and 20 years of experience, suggesting that nearly a third of the workforce has moderate to high levels of expertise. Officers with between 5 and 10 years of experience make up 18.59% (29 individuals), while those with less than five years of experience constitute 19.23% (30 officers), indicating a notable proportion of relatively newer entrants to the banking field. The educational qualifications of the bank officers surveyed revealed that significant majority, 59.61% (93 officers), hold a graduate degree as their highest qualification, making it the most common educational attainment in the sample. Postgraduates account for 36.54% (57 officers). A small minority, 3.85% (6 officers), fall into the "Others" category.

4.8 Variables for the Study

This section follows the demographic profile of respondents and precedes the detailed analysis of specific risk management variables, setting the stage for the empirical evaluation of bank officers' perceptions.

4.8.1 Understanding Risk and Risk Management

Each bank officers undergo a comprehensive training on various banking aspect including operations, customer service and risk management. Furthermore, banks in India are required to strictly comply with the requirements pertaining to guidelines set by the Reserve Bank of India and the Government of India. To capture the URRM aspects of risk management, 7 statements were included to capture the level of understanding of bank officers towards risk and risk management.

Table 4.15: Responses to Statements about Understanding Risk and Risk Management

No.	Statements	Frequency of 4-5	% of Whole sample	Median
1	There is a common understanding of the risk management across the bank.	144	92.31	4
2	Responsibility for risk management is clearly set out and understood by bank.	138	88.46	4
3	Accountability for risk management is clearly set out and understood by bank.	135	86.54	4
4	Managing Risk is important to the performance and success of the bank.	147	94.23	5
5	Application of risk management techniques reduce cost or expected loss.	147	94.23	5
6	The bank carries out a comprehensive and systematic identification of its risk relating	153	98.08	4

	to each of its declared aims and objectives.			
7	The bank identifies the main potential risks relating to each of its declared aims and objectives.	150	96.15	4

Source: Primary Data Analysis

The findings presented in Table 4.15 shed light on the respondents' perspectives regarding the understanding of risk and risk management within the surveyed bank. The data indicates a high level of consensus among participants, with substantial agreement on key aspects. Notably, 92.31% of respondents affirm a common understanding of risk management across the bank, emphasizing a shared comprehension within the organizational context. Furthermore, 88.46% and 86.54% express clarity about their responsibility and accountability for risk management, respectively, underscoring a well-defined structure in place. The importance of managing risk is overwhelmingly acknowledged, as 94.23% of respondents believe it is crucial to the bank's performance and success. Additionally, an equally high percentage (94.23%) recognizes that the application of risk management techniques contributes to cost reduction or mitigates expected losses. The robustness of the risk management framework is evident, with 98.08% affirming the bank's comprehensive and systematic identification of risks aligned with its declared aims and objectives. Moreover, 96.15% acknowledge the bank's adeptness in identifying the main potential risks associated with its objectives.

4.8.2 Availability of Resources for Risk Management

The data presented in Table 4.16 provides insights into the responses regarding the availability of resources for risk management within the surveyed banks. Notably, 86.54% of participants affirm the existence of proper guidelines for managing risk, indicating a strong foundation for risk management practices. The use of quantitative methods for risk assessment is prevalent, with 90.38% of respondents acknowledging this approach, suggesting a reliance on numerical data for a comprehensive risk analysis. In contrast, 67.31% of respondents acknowledge the

use of qualitative methods, highlighting a diverse risk assessment framework. The greater emphasis on the availability of quantitative methods over qualitative methods indicates that banks prioritize tangible documents more than subjective judgments when evaluating risks. The analysis extends to the cost and benefits evaluation of addressing risks, with 80.77% of participants reporting its inclusion in their banks' risk analysis. Furthermore, the establishment of a Written Risk Policy is a common practice (80.77%), and its approval by the Board of Directors is almost unanimous (92.31%), underscoring the importance of top-level endorsement. Regular reviews of the Risk Strategy by the Board of Directors are reported by 84.62% of respondents, showcasing a commitment to ongoing evaluation. Communication and clarity in roles are also emphasized, with 86.54% affirming the proper communication of policies and 82.69% indicating clear delineation of individual roles.

Table 4.16: Responses to Statements about Availability of Resources for Risk Management

S.no	Statements	<i>Frequency of 4-5</i>	<i>% of Whole sample</i>	<i>Median</i>
1	There is a proper set of guidelines for managing risk.	135	86.54	4
2	Risks are assessed by using quantitative methods.	141	90.38	4
3	Risks are assessed by using qualitative methods.	105	67.31	4
4	Risks analysis of your bank includes assessment of the cost and benefits of addressing risk.	126	80.77	4
5	My bank uses model for market risk assessment	138	88.46	4
6	My bank has an establishment of a Written Risk Policy	126	80.77	4

7	My bank Risk Policy is duly approved by the Board of Directors (BOD).	144	92.31	4
8	My bank BOD periodically reviews the Risk Strategy	132	84.62	4
9	In my bank, Policy has been properly communicated down the line.	135	86.54	4
10	In my bank, Policy clearly spells out the roles of individuals.	129	82.69	4

Source: Primary Data Analysis

4.8.3 Perception of Bankers towards Risk Management

Table 4.17 presents a comprehensive overview of the responses related to perception of bankers towards risk management within the surveyed institutions. The data highlights a robust focus on funding and liquidity management, with 92.31% of respondents acknowledging their bank's capability to identify Medians to meet funding requirements. Moreover, an overwhelming 88.46% confirm the existence of a contingency funding plan for liquidity, underlining the preparedness of these banks to navigate potential financial challenges. The emphasis on effective risk management is evident in the unanimous agreement (96.15%) that reporting and communication processes support this endeavor.

Credit risk strategy is a focal point, with 86.54% of respondents reporting periodic reviews by management, indicative of a proactive approach to credit risk management. Basel Accord is highly regarded by the surveyed banks, with 84.62% expressing the importance of its implementation. The impact of Basel Accord on the banks is substantial, as evidenced by 84.62% of respondents acknowledging its significance, and an equally high percentage (84.62%) attesting to its positive influence on risk management practices. The importance of IT infrastructure is also emphasized, with 82.69% of participants affirming that their banks have sufficient IT arrangements to meet the requirements of Basel Accord.

Table 4.17: Responses to Statements about Perception of Bankers towards Risk Management

S.no	Statements	Frequency of 4-5	% of Whole sample	Median
1	Bank identify the Medians to meet its funding requirement	144	92.31	4
2	Bank has contingency funding plan for liquidity	138	88.46	4
3	Reporting and communication processes support the effective risk management.	150	96.15	4
4	Management periodically review the credit risk strategy	135	86.54	4
5	The implementation of Basel accord in banking sector is very important.	132	84.62	4
6	The application of Basel accord has a significant impact on the bank.	132	84.62	4
7	The Basel Accord has improved the Risk management practices of the bank.	132	84.62	4
8	The bank has sufficient IT arrangements to meet the requirements of Basel Accord.	129	82.69	4

Source: Primary Data Analysis

4.8.4 Risk Identification

Table 4.18 provides insights into the perceptions and practices related to Risk Identification within the surveyed banking institutions. The recognition and identification of changes in risk concerning the bank's roles and responsibilities are acknowledged by 82.69% of respondents, indicating a high level of awareness and responsiveness to evolving risks. This suggests a proactive approach to risk management, aligning risk identification with the bank's specific functions.

However, the awareness of strengths and weaknesses in the risk management systems of other banks appears to be moderate, with 50.00% of respondents expressing knowledge in this regard. The perceived difficulty in prioritizing main risks is also reported by 50.00% of participants, indicating a potential challenge in establishing clear risk priorities within these banks. On a positive note, a comprehensive and systematic identification of risks related to the bank's declared aims and objectives is evident, with 82.69% of respondents affirming this practice. This suggests a holistic approach to risk identification, aligning risk management with the overarching goals of the institution.

Furthermore, the development and application of procedures for the systematic identification of investment opportunities are reported by a significant 80.77% of respondents. This indicates a strategic focus on not only risk mitigation but also on identifying and capitalizing on investment opportunities.

Table 4.18: Responses to Statements about Risk Identification

S.no	Statements	Frequency of 4-5	% of Whole sample	Median
1	Changes in risk are recognized and identified with the bank's roles and responsibilities	129	82.69	4
2	My bank is aware of the strengths and weaknesses of the risk management systems of other banks.	78	50.00	3.5
3	The Bank finds it difficult to prioritize as main risk.	78	50.00	3.5
4	The bank carries out a comprehensive and systematic identification of its risks relating to each of its declared aims and objectives	129	82.69	4
5	My bank has developed and applied procedures for the systematic identification	126	80.77	4

	of investment opportunities			
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Source: Primary Data Analysis

4.8.5 Risk Analysis and Monitoring

Table 4.19 provides a detailed overview of the responses related to the Risk analysis and monitoring practices within the surveyed banks. The data reveals a strong emphasis on the credibility of financial statements, with 98.08% of respondents indicating that their banks actively check and analyze the financial statements of borrowers. This underscores a commitment to thorough due diligence in assessing the financial health of borrowers.

Moreover, the gathering of information on borrowers' credibility from sources beyond financial statements is reported by 98.08% of participants, highlighting a comprehensive approach to risk assessment. The appropriateness of the level of control for the identified risks is affirmed by 96.15% of respondents, suggesting a well-balanced risk management framework.

The evaluation of the effectiveness of existing controls and risk management responses receives unanimous agreement (100.00%), showcasing a commitment to continuous improvement and adaptability in response to evolving risks. Action plans for implementing decisions about identified risks are similarly emphasized, with 98.08% of respondents indicating proactive risk management strategies.

The understanding of borrowers' sources of repayment is demonstrated by 94.23% of respondents, reflecting a keen awareness of the factors influencing the ability to repay loans. Exposure limits set by the board are adhered to by 96.15% of participants, and a majority (84.62%) review these limits in view of market conditions, indicating a dynamic and responsive risk management approach. Communication of credit policy is robust, with 98.08% of participants affirming proper communication down the line. Manuals for credit evaluation and approval are in place for 98.08% of respondents, and a full 100.00% confirm adherence to these manuals, underlining the importance of standardized and consistent credit evaluation practices.

Table 4.19: Responses to Statements about Risk Analysis and Monitoring

S.no	Statements	Frequency of 4-5	% of Whole sample	Median
1	Check the credibility of financial statements of borrowers	153	98.08	4.5
2	Analyze the financial statements of borrowers	147	94.23	4
3	Gather information on borrowers'' credibility from other sources	153	98.08	4
4	The level of control is appropriate for the risks	150	96.15	4
5	Evaluation of the effectiveness of the existing controls and risk management responses.	156	100.00	4
6	Action plans for implementing decisions about identified risk.	153	98.08	4
7	Bank have a good understanding of borrowers'' source of repayment	147	94.23	4
8	Bank have exposure limits set by the board	150	96.15	4
9	Bank ensures that these limits are commensurate with the overall market risk management policy	117	75.00	4
10	Bank review these limits in view of market conditions	132	84.62	4
11	Credit policy been properly communicated down the line	153	98.08	4
12	Banks have manuals for credit evaluation and approval	153	98.08	4
13	Bank follows the credit manuals in letter and periodically reviews these manuals?	156	100.00	4

Source: Primary Data Analysis

4.8.6 Risk Management Practices

Table 4.20 provides a comprehensive overview of the responses regarding Risk Management Practices (RMP) within the surveyed banks. The data reveals a strong commitment to the integration of risk management into routine management reporting, with 98.08% of respondents indicating that monitoring risk management is an integral part of regular management activities. This suggests a proactive and ongoing approach to risk oversight within the organizational structure.

Consideration given to staff rotation within a reasonable time is reported by 84.62% of participants, indicating recognition of the importance of varied experiences in managing risks. Additionally, the establishment of a separate function for operational risk management, independent of internal audit, is prevalent, with 90.38% of respondents affirming this practice. This separation underscores the importance of maintaining independence and objectivity in risk management processes.

The consideration of both external and internal factors posing liquidity risk while formulating policies is a strong focus, with 98.08% of participants acknowledging this practice. Procedural manuals for liquidity management are reported by 94.23% of respondents, reflecting a structured and systematic approach to liquidity risk mitigation. While 75.00% of respondents confirm the existence of a separate Risk Management Department (RMD) to ensure compliance with risk management policy, the usage of Credit Derivatives for mitigating and eliminating credit risk is affirmed by 88.46% of participants. This indicates a diverse range of risk mitigation strategies employed by these banks.

The development of systems and procedures to institute an effective risk management framework receives unanimous agreement from all respondents (100.00%), showcasing a comprehensive and structured approach to risk management. The establishment of an independent committee to identify and monitor various risks is reported by 88.46% of respondents, emphasizing a collaborative and multifaceted approach to risk oversight. Continuous review and feedback on risk management strategies and performance are deemed efficient by 82.69% of participants, showcasing a commitment to continuous improvement.

The internal auditor's responsibility to examine risk management guidelines, systems, and reports is affirmed by 88.46% of respondents, underscoring the importance of internal audit in ensuring the effectiveness of risk management practices. Finally, the board's role in establishing operational risk tolerance levels and setting strategic directions related to operational risk is acknowledged by 82.69% of participants, indicating a top-down approach to aligning risk management with the organization's strategic goals.

Table 4.20: Responses to Statements about Risk Management Practices

S.no	Statements	Frequency of 4-5	% of Whole sample	Median
1	Monitoring the risk management is an integral part of routine management reporting.	153	98.08	4
2	Consideration given to staff rotation within a reasonable time	132	84.62	4
3	Separate function of operational risk management, independent of internal audit	141	90.38	4
4	Consideration to external and internal factors posing liquidity risk while formulating the policy.	153	98.08	4
5	Procedural manuals for liquidity management	147	94.23	4
6	Separate Risk Management Department (RMD) exists to ensure compliance with risk management policy.	117	75.00	4
7	Bank is using Credit Derivatives for mitigating and Eliminating Credit Risk.	138	88.46	4
8	Credit Risk is controlled on an integrated basis	114	73.08	4

9	Developed systems and procedures to institute effective risk management framework	156	100.00	4
10	The bank has an independent committee to identify, monitor the various risks.	138	88.46	4
11	Efficient in continuous review/feedback on risk management strategies and performance.	129	82.69	4
12	The internal auditor has the responsibility to examine the risk management guidelines, systems and reports.	138	88.46	4
13	The board establishes operational risk tolerance level and set strategic direction in relation to operational risk	129	82.69	4

Source: Primary Data

4.8.7 Credit Risk Analysis

Table 4.21 provides an in-depth overview of the responses regarding the Credit Risk Analysis within the surveyed banks. The data underscores the strong foundation of credit risk management, as 92.31% of respondents affirm that the bank has a well-designed credit risk policy and an established governance structure. This signifies a commitment to a structured and comprehensive approach to credit risk management.

The impact of inadequate appraisal of borrower's creditworthiness on higher Non-Performing Assets (NPAs) is acknowledged by 92.31% of participants, highlighting the importance of thorough credit assessments in mitigating risk. The adherence to credit rating policies is strong, with 98.08% of respondents indicating that the bank undertakes credit rating in all eligible cases according to the Risk Rating Policy. A specific and detailed analysis, including the client's character, capacity, collaterals, capital, and conditions, is conducted before granting loans, as reported by 100.00% of participants. This reflects a meticulous approach to credit

risk assessment. Credit approval by competent authorities in line with bank policy is reported by 100.00% of respondents, ensuring that credit decisions are made by qualified individuals in accordance with established guidelines. Pre-set norms on exposure limits to individuals or groups are adhered to by 98.08% of participants, demonstrating a disciplined approach to credit risk exposure.

Risk mitigation measures, such as collateral, insurance, and guarantees, are employed by 96.15% of respondents, indicating a proactive stance in safeguarding loans. Regular review and renewal of the existing portfolio, in accordance with the bank's norms, is reported by 98.08% of participants, emphasizing the importance of ongoing monitoring. The use of derivative products and hedging for credit risk mitigation is acknowledged by 88.46% of respondents, showcasing a diversified approach to risk management. Internal controls to avoid postponement of NPA identification are reported by 98.08% of participants, indicating a commitment to timely recognition of potential credit issues.

Optimal credit monitoring tools, including financial due diligence, stock inspection, Monthly Statement of Operational Data (MSOD), Quarterly Prudential Returns (QPRs), and early warning signals, are utilized by 88.46% of respondents during the currency of loans. This emphasizes a multifaceted and proactive approach to credit monitoring. Efficient utilization of credit recovery tools, such as credit guarantee schemes, SARFAESIA, IBC/DRT/DRAT/Civil Suit/RC, is reported by 90.38% of participants, showcasing a comprehensive strategy for managing credit risk throughout the credit lifecycle. Reporting to credit information companies and other agencies in a timely manner is recognized by 92.31% of respondents as contributing to a lesser risk of default by borrowers, highlighting the importance of information sharing in risk management.

Table 4.21: Responses to Statements about Credit Risk Analysis

S.no	Statements	Frequency of 4-5	% of Whole sample	Median
1	The Bank is having a well-designed credit	144	92.31	4

	risk policy and well-established governance structure for credit risk management			
2	Inadequate appraisal of borrower's credit worthiness is causing higher NPAs.	144	92.31	5
3	The Bank undertakes credit rating in all eligible cases as per Risk Rating Policy of the bank.	153	98.08	4
4	Before granting loans, the Bank undertakes a specific analysis including the client's character, capacity, collaterals, capital and conditions properly.	156	100.00	4
5	The competent authority is doing Credit approval as decided by the bank in policy	156	100.00	4.5
6	The Bank is having pre-set norms on exposure limit to individual or group and same is adhered while sanctioning the credit proposal.	153	98.08	4
7	Risk Mitigates in the form of collaterals, insurance and guarantee is taken to safeguard the loan.	150	96.15	5
8	The Bank undertakes regular review / renewal of existing portfolio as per norms of the bank.	153	98.08	4
9	In order to mitigate the credit risk bank is using derivative products / hedging.	138	88.46	4
10	There are internal controls to avoid postponement of identification of NPAs.	153	98.08	5
11	The Bank is having optimal Credit Monitoring Tools viz., Financials due diligence, Stock Inspection, MSOD	138	88.46	4

	(Monthly Statement of Operational Data), QPRs (Quarterly Prudential Return), Early Warning Signals etc. and utilizing the same during the currency of loan.			
12	The Bank is having optimal credit recovery tools viz., Credit guarantee scheme, SARFAESIA, IBC / DRT / DRAT/ CIVIL Suit / RC etc. and utilizing them efficiently as and when needed.	141	90.38	4
13	Reporting to CIC / CRILC/ Other agencies in time resulted in lesser risk of default by borrower.	144	92.31	4

Source: Primary Data

4.9 Types of risk

Similar to banks in various regions across the country, commercial banks in Mizoram encounter various types of risks. They may be more susceptible to heightened risk factors arising from the distinct business environment and a lack of adequate infrastructural facilities. The bank officers were tasked with identifying the predominant risk faced by their respective bank branch, and their responses are outlined in Table 4.22. The findings reveal that commercial banks in Mizoram are exposed to diverse types of risks, with credit risk emerging as the most significant, as anticipated. This result is similar with the findings of Hameeda and Al-Ajmi (2012). Another significant risk is operational risk, specifically encompassing challenges related to network and communication, deposit mobilization issues, and also competition from other banks. However, it has been observed that the nature of risks to which banks are exposed varies among different sampled banks. Although officers of banks such as MCAB and MRB unanimously consider credit risk to be the predominant risk they face, 47.06% of the SBI officers assert that their institution is more susceptible to other risks, such as market risk and operational risk. The authors

believe that the diminished susceptibility of SBI to credit risk is attributed to the adoption of a risk management strategy wherein the bank mitigates credit risk by reallocating its deposits towards securities instead of loans. This notion is supported by the low credit deposit ratio of commercial banks excluding MCAB and MRB which stood at 38.69 during 2021-22 while MCAB and MRB have a credit deposit ratio of 70.64 and 59.30 during the same period.

Table 4.22: Most Significant Risk Faced by Banks

Type of Risk	SBI		MRB		MCAB	
Credit Risk	28	52.94%	63	100%	40	100%
Operational Risk	19	35.29%	0	-	0	-
Market Risks	6	11.77%	0	-	0	-
Total	53	100	63	100	40	100

Source: Primary Data

4.10 Testing the Hypothesis regarding Risk Management Practices

This section examines the relationships between risk management practices (RMPs) and six key factors: understanding of risks and risk management (URRM), availability of resources for risk management (ARRM), bankers' perceptions of risk management practices (PBRM), risk identification (RI), risk analysis and monitoring (RAM), and perceptions of credit risk management (CRM). These relationships are tested through five hypotheses using Spearman's rank correlation, given the ordinal nature of the data. The analysis is based on responses from 156 bank officers in Mizoram, with results presented in Table 4.23.

4.10.1 Hypotheses

The following hypotheses were tested to assess the factors influencing the adoption and effectiveness of risk management practices in banks:

H₁₂: A higher level of understanding of risks and risk management (URRM) among bank officers is positively associated with the adoption and effectiveness of risk management practices (RMP) in banks.

- H₁₃: Greater availability of resources for risk management (ARRM) in banks is positively associated with the adoption and effectiveness of risk management practices (RMP) in banks.
- H₁₄: Positive perception of bankers towards credit risk management practices (PBRM) is positively associated with the adoption and effectiveness of overall risk management practices (RPM).
- H₁₅: Effective risk identification (RI) is positively associated with the implementation and success of risk management practices (RMP).
- H₁₆: Robust risk analysis and monitoring (RAM) are positively associated with the implementation and effectiveness of risk management practices (RMP)
- H₁₇: Robust Credit Risk Management (CRM) is positively associated with the implementation and effectiveness of risk management practices (RMP).

Spearman's rank correlation was employed to analyse the relationships between RMPs and the six factors (URRM, ARRM, PBRM, RI, RAM, and CRM). This non-parametric method is suitable for ordinal data and measures the strength and direction of monotonic relationships. The correlation coefficients and p-values are presented in Table 4.23.

4.10.2 Results

The Spearman's correlation results, summarized in Table 4.23, indicate varying levels of support for the hypotheses. The findings are organized by hypothesis for clarity, with correlation coefficients, significance levels, and interpretations provided.

Table 4.23: Spearman Correlations

		RMP	URRM	ARRM	PBRM	RI	RAM	CRM
RMP	Correlation Coefficient	1.000	.061	.252**	.589**	.109	.450**	.508**
	Sig. (2-tailed)	.	.452	.002	.000	.176	.000	.000

	N	156	156	156	156	156	156	156
URRM	Correlation Coefficient	.061	1.000	.375**	.165*	.343**	.264**	.393**
	Sig. (2-tailed)	.452	.	.000	.040	.000	.001	.000
	N	156	156	156	156	156	156	156
ARRM	Correlation Coefficient	.252**	.375**	1.000	.188*	.331**	.624**	.444**
	Sig. (2-tailed)	.002	.000	.	.019	.000	.000	.000
	N	156	156	156	156	156	156	156
PBRM	Correlation Coefficient	.589**	.165*	.188*	1.000	.138	.450**	.429**
	Sig. (2-tailed)	.000	.040	.019	.	.086	.000	.000
	N	156	156	156	156	156	156	156
RI	Correlation Coefficient	.109	.343**	.331**	.138	1.000	.171*	.069
	Sig. (2-tailed)	.176	.000	.000	.086	.	.032	.395
	N	156	156	156	156	156	156	156
RAM	Correlation Coefficient	.450**	.264**	.624**	.450**	.171*	1.000	.519**
	Sig. (2-tailed)	.000	.001	.000	.000	.032	.	.000
	N	156	156	156	156	156	156	156
CRM	Correlation Coefficient	.508**	.393**	.444**	.429**	.069	.519**	1.000
	Sig. (2-tailed)	.000	.000	.000	.000	.395	.000	.
	N	156	156	156	156	156	156	156

****p < 0.01, *p < 0.05 (2-tailed)**

Source: Primary Data Analysis

H₁₂: A higher level of understanding of risks and risk management (URRM) among bank officers is positively associated with the adoption and effectiveness of risk management practices (RMP) in banks.

The correlation between Understanding of Risks and Risk Management (URRM) and Risk Management Practices (RMP) was weak and statistically insignificant ($p = 0.061$, $p = 0.452$). This suggests no meaningful monotonic relationship between bank officers' understanding of risks and the adoption or effectiveness of risk management practices. Contrary to prior studies (e.g., Acharya & Richardson, 2010), the null hypothesis is failed to be rejected and the alternative hypothesis H_{12} is rejected. This suggested that a higher level of understanding of risks and risk management among bank officers is positively associated with the adoption and effectiveness of risk management practices in banks, however indicating that a higher understanding of risks among bank officers does not significantly enhance risk management practices in this sample of 156 officers from the selected banks in Mizoram.

H₁₃: Greater availability of resources for risk management (ARRM) in banks is positively associated with the adoption and effectiveness of risk management practices (RMP) in banks.

A weak but statistically significant positive correlation was found between ARRM and RMP ($p = 0.252$, $p = 0.002$). This indicates that greater resource availability is associated with improved adoption and effectiveness of risk management practices, though the relationship is weak (Myers & Well, 2003). This finding aligns with Costello and Minnis (2024) and supports H_{13} . The weak but statistically positive correlation could imply resource levels vary within a constrained range, potentially capping ARRM's impact towards RMP.

H₁₄: Positive perception of bankers towards credit risk management practices (PBRM) is positively associated with the adoption and effectiveness of overall risk management practices (RPM).

A moderately strong and highly significant positive correlation was observed between PBRM and RMP ($\rho = 0.589$, $p < 0.01$). This suggests that positive perceptions among bankers significantly enhance the quality and implementation of risk management practices. Thus, the null hypothesis is rejected and the alternative hypothesis H_1 is failed to be rejected, consistent with the literature emphasizing the role of perception in risk management outcomes. This suggests that as officers' perceptions improve, so does the quality or implementation of risk management practices, with a notable effect size. This supports the hypothesis H_{14} that 'positive perception of bankers towards risk management practices is positively associated with the adoption and effectiveness of overall risk management practices.'

H₁₅: Effective Risk Identification (RI) is positively associated with the implementation and success of Risk Management Practices (RMP).

The correlation between RI and RMP is positive with coefficient of 0.109, but very weak (Myers & Well, 2003) and statistically insignificant at $p = 0.176$ (not significant at $p < 0.05$ or $p < 0.01$). This indicated no meaningful monotonic relationship between effective RI and the implementation/success of RMP. This very weak, insignificant relationship (Myers & Well, 2003) contrasts with literature (e.g., Allen & Saunders, 2012; Acharya & Richardson, 2010). Thus, the hypothesis H_{15} which states that 'effective risk identification is positively associated with the implementation and success of risk management practices' is not supported by our sample.

H₁₆: Robust risk analysis and monitoring (RAM) are positively associated with the implementation and effectiveness of Risk Management Practices (RMP)

The Spearman's correlation of 0.450 is positive, moderately strong, and highly significant ($p < 0.01$, significant at the 0.01 level, 2-tailed), indicating a robust monotonic relationship between risk analysis and monitoring (RAM) and the

implementation/effectiveness of risk management practices (RMP). This suggests that as officers' capabilities in risk analysis and monitoring improve, so does the quality and success of risk management practices, with a substantial effect size. This moderately strong relationship (Myers & Well, 2003) aligns with the literature (e.g., Jorion, 2007; Costello & Minnis, 2024) that risk analysis and monitoring underpins the successful risk management practices. Thus, the null hypothesis is rejected and the alternative hypothesis H_{16} is failed to be rejected.

H₁₇: Robust Credit Risk Management (CRM) is positively associated with the implementation and effectiveness of Risk Management Practices (RMP).

The correlation between CRM and RMP is positive with a correlation coefficient of 0.508, moderately strong, and highly significant ($p < 0.01$, significant at the 0.01 level, 2-tailed), indicating a robust monotonic relationship between bankers' positive perceptions of credit risk management (CRM) and the adoption/effectiveness of overall risk management practices (RMP). This suggests that as officers' perceptions of credit risk practices improve, so does the quality and implementation of broader risk management, with a substantial effect size. This moderately strong relationship (Myers & Well, 2003) aligns with findings (e.g., Chu & Ng, 2023; Altman & Saunders, 1997) that trust in credit tools drives broader risk outcomes. The hypothesis H_{17} which state that 'positive perception of bankers towards credit risk management practices is positively associated with the adoption and effectiveness of overall risk management practices' is failed to be rejected.

4.11 Testing Hypotheses on Bankers' Perceptions of Risk Management Practices (RMP) and Credit Risk Management Practices (CRM)

Risk management practices (RMP) and credit risk management practices (CRM) are essential to the stability and performance of banking institutions, particularly in a unique regional context like Mizoram, where public sector banks such as the State Bank of India (SBI), Mizoram Rural Bank (MRB), and Mizoram Cooperative Apex Bank (MCAB) operate. Despite sharing a common regulatory framework, these banks differ in resources, scale, and operational focus, which may influence how bank officers perceive RMP and CRM. RMP encompasses strategies

for mitigating operational, liquidity, and compliance risks, while CRM focuses on credit-specific controls, such as loan appraisal and recovery, critical to banking performance (Saunders & Cornett, 2017). Demographic factors, including gender and work experience, may further shape these perceptions, reflecting individual and institutional priorities (Mishra & Prakash, 2018). Understanding these perceptual differences is essential for tailoring effective risk management frameworks in Mizoram's banking sector.

This section tests six hypotheses to examine whether perceptions of RMP and CRM vary across banking institutions, gender, and work experience among 156 bank officers in Mizoram. Non-parametric statistical tests, suitable for ordinal data, were employed to analyse these relationships. The results provide insights into the factors influencing risk management perceptions and their implications for banking resilience.

4.11.1 Hypotheses

The following hypotheses were tested to assess the variability and positivity of bankers' perceptions of RMP and CRM:

- H₁₈: The perception of risk management practices (RMP) varies significantly among bank officers across selected banks.*
- H₁₉: Male bank officers perceive risk management practices (RMP) more positively than female bank officers.*
- H₂₀: Bank officers with greater work experience perceive risk management practices (RMP) more positively than those with less work experience.*
- H₂₁: The perception of credit risk management practices (CRM) varies significantly among bank officers across selected banks.*
- H₂₂: Male bank officers perceive credit risk management practices (CRM) more positively than female bank officers.*
- H₂₃: Bank officers with greater work experience perceive credit risk management practices (CRM) more positively than those with less work experience.*

Non-parametric statistical tests were employed due to the ordinal nature of the Likert-scale data. For hypotheses H₁₈ and H₂₁ (variation across banking institutions) and H₂₀ and H₂₃ (variation across work experience), the Kruskal-Wallis H test was used, suitable for comparing more than two independent groups. For hypotheses H₁₉ and H₂₂ (gender differences), the Mann-Whitney U test was applied, appropriate for comparing two independent groups. Data were collected from 156 bank officers across SBI, MRB, and MCAB, ensuring sufficient sample size for robust analysis (Siegel & Castellan, 1988). Results are presented in Tables 4.22–4.27, with mean ranks and test statistics reported.

4.11.2 Results

The results are organized by grouping variable (banking institution, gender, work experience) and presented for RMP and CRM separately. Each subsection addresses the relevant hypotheses, supported by tables and statistical interpretations.

4.11.2.1 Grouping Variable: Bank wise

Hypotheses H₁₈ and H₂₁ examine whether perceptions of RMP and CRM vary significantly across SBI, MRB, and MCAB. The Kruskal-Wallis H test was used to compare mean ranks of RMP and CRM scores across the three banks.

Table 4.24: Mean Ranks of Bank Officers' Perceptions of RMP and CRM Bank wise

Variable	Bank Name	N	Mean Rank
RMP	SBI	53	87.09
	MRB	63	71.98
	MCAB	40	77.39
	Total	156	
CRM	SBI	53	83.76
	MRB	63	75.21
	MCAB	40	76.70
	Total	156	

Source: Primary Data Analysis

Table 4.25: Kruskal-Wallis Test Results for RMP and CRM Perceptions Across Banks

Statistic	RMP	CRM
Chi-Square	6.205	1.524
Degrees of Freedom	2	2
Asymp. Sig. (2-tailed)	.045	.467

Source: Primary Data Analysis

H₁₈: The perception of risk management practices (RMP) varies significantly among bank officers across selected banks.

The Kruskal-Wallis H test yielded a significant result ($\chi^2 = 6.205$, $df = 2$, $p = 0.045$), indicating that perceptions of RMP vary significantly across the three banks. Table 4.24 shows SBI officers had the highest mean rank (87.09), followed by MCAB (77.39) and MRB (71.98), suggesting SBI officers perceive RMP most positively. Thus, the null hypothesis is rejected and the alternative hypothesis H_{18} is failed to be rejected.

H₂₁: The perception of credit risk management practices (CRM) varies significantly among bank officers across selected banks.

The test was not significant ($\chi^2 = 1.524$, $df = 2$, $p = 0.467$), indicating no significant variation in CRM perceptions across banks. Although SBI officers had the highest mean rank (83.76), followed by MCAB (76.70) and MRB (75.21), the differences were not statistically significant. Thus, the null hypothesis is failed to be rejected and the alternative hypothesis H_{21} is rejected.

4.11.2.2 Grouping Variable: Gender

Hypotheses H_{19} and H_{22} test whether male bank officers perceive RMP and CRM more positively than female officers. The Mann-Whitney U test was used to compare perceptions by gender.

Table 4.26: Mean Ranks of Bank Officers' Perceptions of RMP and CRM by Gender

Variable	Gender	N	Mean Rank	Sum of Ranks
RMP	Male	87	74.17	6453.00
	Female	69	83.96	5793.00
	Total	156		
CRM	Male	87	77.78	6766.50
	Female	69	79.41	5479.50
	Total	156		

Source: Primary Data Analysis

Table 4.27: Mann-Whitney U Test Results for RMP and CRM Perceptions across Gender

Statistic	RMP	CRM
Mann-Whitney U	2625.000	2938.500
Wilcoxon W	6453.000	6766.500
Z	-1.855	-0.263
Asymp. Sig. (2-tailed)	.064	.793

Source: Primary Data Analysis

H₁₉: Male bank officers perceive risk management practices (RMP) more positively than female bank officers.

The Mann-Whitney U test showed no significant difference in RMP perceptions between male and female officers (U = 2625.000, z = -1.855, p = 0.064). Female officers had a higher mean rank (83.96) than male officers (74.17), suggesting females perceive RMP slightly more positively, though not significantly at $p < 0.05$. Thus, the null hypothesis is failed to be rejected and the alternative hypothesis H_{19} is rejected.

H_{22} : *Male bank officers perceive credit risk management practices (CRM) more positively than female bank officers.*

No significant difference was found between male and female officers ($U = 2938.500$, $z = -0.263$, $p = 0.793$). Female officers had a marginally higher mean rank (79.41) than male officers (77.78), but the difference was negligible. Thus, the null hypothesis is failed to be rejected and the alternative hypothesis H_{22} is rejected.

4.11.2.3 Grouping Variable: Work Experience

Hypotheses H_{20} and H_{23} explore whether officers with greater work experience perceive RMP and CRM more positively. The Kruskal-Wallis H test was used to compare perceptions across five experience categories: less than 5 years, 5–10 years, 10–20 years, 20–30 years, and more than 30 years.

Table 4.28: Mean Ranks of Bank Officers' Perceptions of RMP and CRM by Work Experience

Variable	Experience Class	N	Mean Rank
RMP	Less than 5 years	30	72.55
	Between 5 and 10 years	29	79.22
	Between 10 and 20 years	49	75.91
	Between 20 and 30 years	28	80.39
	More than 30 years	20	86.30
	Total	156	
CRM	Less than 5 years	30	76.00
	Between 5 and 10 years	29	85.09
	Between 10 and 20 years	49	68.72
	Between 20 and 30 years	28	79.44
	More than 30 years	20	91.50
	Total	156	

Source: Primary Data Analysis

Table 4.29: Kruskal-Wallis Test Results for RMP and CRM Perceptions across Work Experience

Statistic	RMP	CRM
Chi-Square	2.524	6.423
Degrees of Freedom	4	4
Asymp. Sig. (2-tailed)	.640	.170

Source: Primary Data Analysis

H₂₀: Bank officers with greater work experience perceive risk management practices (RMP) more positively than those with less work experience.

The Kruskal-Wallis H test was not significant ($\chi^2 = 2.524$, $df = 4$, $p = 0.640$). Although officers with more than 30 years of experience had the highest mean rank (86.30), followed by 20–30 years (80.39), and those with less than 5 years had the lowest (72.55), the differences were not statistically significant. Thus, the null hypothesis is failed to be rejected and the alternative hypothesis H_{20} is rejected.

H₂₃: Bank officers with greater work experience perceive credit risk management practices (CRM) more positively than those with less work experience.

The test was also not significant ($\chi^2 = 6.423$, $df = 4$, $p = 0.170$). Officers with more than 30 years of experience had the highest mean rank (91.50), but the 10–20 years group had the lowest (68.72), indicating inconsistent patterns. Again, the null hypothesis is failed to be rejected and the alternative hypothesis H_{23} is rejected.

4.12 Summary of Hypothesis

This section consolidates the findings from the empirical analyses conducted to test the hypotheses related to non-performing assets (NPA), bank profitability, risk management practices (RMP), and credit risk management (CRM) perceptions in Mizoram’s banking sector. The study examines a comprehensive set of hypotheses (H_1 – H_{23}) to investigate the relationships between key financial, economic, and perceptual factors and their impact on bank performance and risk management effectiveness. Specifically, the hypotheses explore the influence of capital adequacy, corporate governance, lending practices, macroeconomic conditions, and bankers’

perceptions on NPA and profitability, as well as the variation in risk management perceptions across institutional and demographic factors. Drawing on statistical analyses, including fixed effect regressions, OLS and GLS models, Spearman's correlations, Kruskal-Wallis H tests, and Mann-Whitney U tests, the results provide insights into the dynamics of risk and profitability in the context of Mizoram's public sector banks, such as the State Bank of India (SBI), Mizoram Rural Bank (MRB), and Mizoram Cooperative Apex Bank (MCAB). The following summary presents the outcomes for each hypothesis, indicating whether they are rejected or not failed to be rejected, along with key statistical evidence, to facilitate a clear understanding of the factors shaping banking performance and risk management in this regional context.

H₁: There is a negative relationship between Capital Adequacy Ratio (CRAR) and Non-Performing Assets (NPA).

Result: The null hypothesis (H_0) is rejected. And the alternative hypothesis (H_1) failed to be rejected, with a significant negative relationship (coefficient = -0.784, $p = 0.000$), indicating that higher capital adequacy reduces NPA.

H₂: There is a positive relationship between Credit Growth (CG) and Non-Performing Assets (NPA).

Result: The null hypothesis (H_0) failed to be rejected. And the alternative hypothesis (H_2) is rejected, as the positive relationship is insignificant (coefficient = 0.158, $p = 0.126$), suggesting credit risk has no significant impact on NPA.

H₃: There is a positive relationship between Credit Deposit Ratio (CDR) and Non-Performing Assets (NPA).

Result: The null Hypothesis (H_0) is rejected. And the alternative hypothesis (H_3) failed to be rejected, with a significant positive relationship (coefficient = 0.509, $p = 0.036$), indicating that higher credit-deposit ratios increase NPA.

H₄: There is a negative relationship between Economic Growth (GDP) and Non-Performing Assets (NPA).

Result: The null Hypothesis (H_0) is rejected. And the alternative hypothesis (H_4) failed to be rejected, with a significant negative relationship (coefficient = -2.366, $p = 0.005$), indicating that higher GSDP reduces NPA.

H_5 : *There is a positive relationship between Inflation (INF) and Non-Performing Assets (NPA).*

Result: The null hypothesis (H_0) failed to be rejected. And the alternative hypothesis (H_5) is rejected, as the relationship is significantly negative (coefficient = -2.800, $p = 0.000$), contrary to the hypothesized positive relationship.

H_6 : *There is a negative relationship between Return on Assets (ROA) and Non-Performing Assets (NPA).*

Result: The null hypothesis (H_0) failed to be rejected. And the alternative hypothesis (H_6) is rejected, as the negative coefficient for Log_NPA (-0.007) is statistically insignificant ($p = 0.977$ in OLS; $p = 0.974$ in GLS) and the effect size is minimal.

H_7 : *There is a negative relationship between Return on Equity (ROE) and Non-Performing Assets (NPA).*

Result: The null hypothesis (H_0) failed to be rejected. And the alternative hypothesis (H_7) is rejected, as the positive coefficient for Log_NPA (3.0190) contradicts the hypothesized negative relationship, and the relationship is insignificant ($p = 0.805$ in OLS). The model's poor fit for ROE limit's reliability.

H_8 : *There is a negative relationship between Return on Assets (ROA) and Capital Adequacy Ratio (CRAR).*

Result: The null hypothesis (H_0) failed to be rejected. And the alternative hypothesis (H_8) is rejected, as the positive coefficient for Log_NPA (3.0190) contradicts the hypothesized negative relationship with ROE, and the relationship is statistically insignificant ($p = 0.805$ in OLS). The model's poor fit for ROE further undermines the reliability of these findings.

H₉: There is a negative relationship between Return on Equity (ROE) and Capital Adequacy Ratio (CRAR).

Result: The null hypothesis (H_0) failed to be rejected. And the alternative hypothesis (H_9) is rejected, as the positive coefficient for CRAR (11.7630) in both OLS (p-value = 0.567) and GLS (p-value = 0.559) models indicates a positive but statistically insignificant relationship with ROE, failing to meet the 0.05 significance level.

H₁₀: There is a negative relationship between Return on Assets (ROA) and Credit Deposit Ratio (CDR).

Result: The null hypothesis (H_0) failed to be rejected. And the alternative hypothesis (H_{10}) is rejected, as the positive coefficient for CDR (0.009) in both OLS (p-value = 0.250) and GLS (p-value = 0.267) models indicates a positive but statistically insignificant relationship with ROA, contradicting the expected negative relationship.

H₁₁: There is a negative relationship between Return on Equity (ROE) and Credit Deposit Ratio (CDR).

Result: The null hypothesis (H_0) failed to be rejected. And the alternative hypothesis (H_{11}) is rejected, as the positive coefficient for CDR (0.27302) in both OLS (p-value = 0.320) and GLS (p-value = 0.335) models indicates a positive but statistically insignificant relationship with ROE, contradicting the expected negative relationship. Consistent with the findings for ROA, there is no statistically significant relationship between CDR and either ROA or ROE ($p > 0.05$).

H₁₂: A higher level of 'Understanding of Risks and Risk Management' (URRM) among bank officers is positively associated with the adoption and effectiveness of Risk Management Practices (RMP) in banks.

Result: The null hypothesis (H_0) is failed to be rejected. And the alternative hypothesis (H_{12}) is rejected, as the Spearman's correlation between URRM and RMP is weak and insignificant ($\rho = 0.061$, $p = 0.452$), suggesting no

significant enhancement of risk management practices from risk understanding.

H₁₃: Greater 'Availability of Resources for Risk Management' (ARRM) in banks is positively associated with the adoption and effectiveness of risk management practices (RMP) in banks.

Result: The alternative hypothesis is failed to be rejected, with a weak but significant positive correlation between ARRM and RMP ($\rho = 0.252$, $p = 0.002$), indicating that greater resources improve risk management practices.

H₁₄: Positive perception of bankers towards credit risk management practices (PBRM) is positively associated with the adoption and effectiveness of overall risk management practices (RPM).

Result: The alternative hypothesis is failed to be rejected, with a moderately strong and significant positive correlation between PBRM and RMP ($\rho = 0.589$, $p < 0.01$), indicating that positive perceptions enhance risk management practices.

H₁₅: Effective Risk Identification (RI) is positively associated with the implementation and success of Risk Management Practices (RMP).

Result: The alternative hypothesis is rejected, as the correlation between RI and RMP is weak and insignificant ($\rho = 0.109$, $p = 0.176$), indicating no significant relationship with risk management success.

H₁₆: Robust risk analysis and monitoring (RAM) are positively associated with the implementation and effectiveness of risk management practices (RMP).

Result: The alternative hypothesis is failed to be rejected, with a moderately strong and significant positive correlation between RAM and RMP ($\rho = 0.450$, $p < 0.01$), indicating that robust risk analysis and monitoring improve risk management practices.

H₁₇: Robust Credit Risk Management (CRM) is positively associated with the implementation and effectiveness of risk management practices (RMP).

Result: The alternative hypothesis is failed to be rejected, with a moderately strong and significant positive correlation between CRM and RMP ($\rho = 0.508$, $p < 0.01$), indicating that positive credit risk perceptions enhance overall risk management.

H₁₈: Bankers' Perception of Risk Management Practices Varies Significantly Among Bank Officers Across Selected banks

Result: The alternative hypothesis is failed to be rejected, with significant variation in RMP perceptions across SBI, MRB, and MCAB ($\chi^2 = 6.205$, $df = 2$, $p = 0.045$), with SBI officers showing the most positive perceptions (mean rank = 87.09).

H₁₉: Male Bank Officers Perceive Risk Management Practices More Positively Than Female Bank Officers

Result: The alternative hypothesis is rejected, as no significant difference exists in RMP perceptions by gender ($U = 2625.000$, $z = -1.855$, $p = 0.064$), with females slightly more positive but not significantly so.

H₂₀: Bank Officers with Greater Work Experience Perceive Risk Management Practices More Positively Than Those with Less Work Experience

Result: The alternative hypothesis is rejected, as no significant difference exists in RMP perceptions across work experience groups ($\chi^2 = 2.524$, $df = 4$, $p = 0.640$), despite higher ranks for more experienced officers.

H₂₁: The Perception of Credit Risk Management Practices Varies Significantly Among Bank Officers across Selected banks.

Result: The alternative hypothesis is rejected, as no significant variation exists in CRM perceptions across SBI, MRB, and MCAB ($\chi^2 = 1.524$, $df = 2$, $p = 0.467$), indicating uniformity in perceptions.

H₂₂: Male Bank Officers Perceive Credit Risk Management Practices More Positively Than Female Bank Officers

Result: The alternative hypothesis is rejected, as no significant difference exists in CRM perceptions by gender ($U = 2938.500$, $z = -0.263$, $p = 0.793$), with negligible differences in mean ranks.

H₂₃: Bank Officers with Greater Work Experience Perceive Credit Risk Management Practices More Positively Than Those with Less Work Experience

Result: The alternative hypothesis is rejected, as no significant difference exists in CRM perceptions across work experience groups ($\chi^2 = 6.423$, $df = 4$, $p = 0.170$), with inconsistent patterns across experience levels.

4.13 Conclusion

This chapter has explained the dynamics of risk management practices within Mizoram's banking sector through a comprehensive analysis. An analysis of nine years of secondary data (2012-13 to 2020-21) from State Bank of India (SBI), Mizoram Rural Bank (MRB), and Mizoram Cooperative Apex Bank (MCAB), reveals that credit risk, proxied by non-performing assets (NPA), is significantly influenced by bank-specific factors such as Capital to Risk-Weighted Assets Ratio (CRAR) and Credit Deposit Ratio (CDR), alongside macroeconomic variables like Gross State Domestic Product (GSDP). Notably, higher CRAR and GSDP correlate with reduced NPAs, underscoring the protective role of capital adequacy and economic growth, while increase CDR amplifies credit risk exposure. The impact of credit risk on profitability, measured by Return on Assets (ROA) and Return on Equity (ROE), shows that—while NPAs exhibit a negative but statistically insignificant effect on ROA, their influence on ROE remains inconclusive, suggesting that profitability in Mizoram's banks may be moderated by factors beyond credit risk alone.

An analysis of primary data highlights a robust and cohesive perception of risk management practices across SBI, MRB, and MCAB. Officers demonstrate a strong consensus on the importance of risk identification, analysis, and mitigation, with quantitative methods—such as statistical models and financial metrics—predominating over qualitative approaches. This preference reflects a data-driven

culture aimed at enhancing precision in risk assessment. Spearman's correlation analysis supports significant positive associations between risk management practices (RMP) and factors like resource availability (ARRM), bankers' perceptions (PBRM), risk analysis and monitoring (RAM), and credit risk management (CRM), though understanding of risk (URRM) and risk identification (RI) show weaker relationship. Notably, credit risk emerges as the preeminent challenge, with SBI officers mitigate credit risks—evidenced by a lower CDR (38.69% in 2021-22)—compared to MRB (59.30%) and MCAB (70.64%), which rely more heavily on lending.

These insights not only enrich the academic discourse on regional banking dynamics but also provide actionable implications for policymakers, regulators, and bank managers. Strengthening capital buffers, optimizing lending practices, and enhancing resource allocation could further fortify Mizoram's financial ecosystem, ensuring its sustained growth and stability in the face of evolving economic challenges

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CHAPTER -5

SUMMARY OF FINDINGS AND SUGGESTIONS

5.1 Findings

A healthy banking sector is a foundation for economic growth and a healthy banking sector requires robust risk management practices. In Mizoram, where the banking sector operates in an environment which is mostly confined to the sector classified as priority sector, understanding risk management practices of the banks operating within is a vital importance. Priority sectors are those sectors which are deemed to be essential for economic growth and generate employment, however, are devoid of credit assessed as they are perceived to be riskier by the bank management. The present study evaluates the determinants of credit risk and its impact on banks' profitability. It also assesses the perceptions of risk management practices by the bank officers. The findings provide a key insight into the Mizoram banking sector and suggest areas to further enhance the risk management practices while serving as a crucial role as a financier and an engine for economic growth. The research outcomes will be applicable to other banks operating in similar regions. The findings are summarized as follows:

- Basel III norms have recommended all banks to maintain a CRAR of 8 percent. In India, the Reserve Bank of India has mandated all commercial banks to maintain a CRAR of 9%, while all Indian Public Sector Banks to maintain CRAR of 12 percent (Srinivasan and Britto, 2017). The study finds that the CRAR of MRB falls below the 12 percent benchmark which is emphasized for public sector banks by the RBI. As of March 2021,MRB recorded a CRAR of 9.48 percent, whereas MCAB maintained a CRAR of 16.13 percent which is well above the stipulated norms.
- As per RBI's data on State-wise Credit Deposit ratio (CDR) of scheduled commercial banks according to place of utilization, the Northeast Region (NER) stood at 46.4 per cent during 2022, while all India CDR was 72.1 per cent during the same period.Mizoram's CDR was 45.7 percent during March 2022, which was lower than the already low CDR of the NER.Among the banks sampled in

our study, the State Bank of India (SBI) has consistently maintained a low Credit-Deposit Ratio (CDR) throughout the study period. The average CDR for SBI during the study period was 33.08%, with a CDR of 35.77% recorded as of March 2021. In comparison, the mean CDR for Mizoram Rural Bank (MRB) and Mizoram Cooperative Apex Bank (MCAB) stood at 49.66% and 63.43%, respectively. As of March 2021, the CDR for MRB and MCAB was 49.39% and 61.46%, respectively. These figures are higher than the CDR for the Northeast Region (NER) during the same period but remain below the national average.

- One of the notable findings of this study is the consistent reduction in the level of Non-Performing Assets (NPAs) among banks operating in Mizoram, reflecting an improvement in asset quality and credit management practices within the regional banking sector. As of March 2021, Mizoram Rural Bank (MRB) reported an NPA ratio of 2.45%, while Mizoram Cooperative Apex Bank (MCAB) recorded an even lower NPA ratio of 2.18%. This downward trend in NPAs is a significant indicator of the financial health of these institutions. Comparatively, the NPA ratios of MRB and MCAB as of March 2021 (2.45% and 2.18%, respectively) are significantly lower than the national average for Indian banks during the same period, which hovered around 7-8% for many public-sector banks. By 2020, both banks exhibited a sharp decline in their NPA levels, with MRB's ratio dropping to 1.41% and MCAB's decreasing to 3.69%. This sharp decline in NPAs from 2019 to 2020 may be attributed to the Reserve Bank of India's (RBI) moratorium policies introduced during the COVID-19 outbreak. The RBI implemented a loan repayment moratorium between March and August 2020 to alleviate financial stress on borrowers amid the pandemic-induced economic disruptions. This measure likely provided temporary relief to borrowers, enabling them to defer repayments without their loans being classified as NPAs, thereby contributing to the observed reduction in NPA ratios for both banks in 2020.
- The analysis reveals a statistically significant negative relationship between the Capital to Risk (Weighted) Assets Ratio (CRAR) and Non-Performing Assets (NPAs) in the sampled banks in Mizoram. The regression coefficient of CRAR (-

0.784) indicates that for every 1% increase in CRAR, the NPA ratio decreases by approximately 0.78%. This relationship is highly significant at the 1% level ($p < 0.01$), supported by a robust t-value of -8.346 and a strong negative standardized beta coefficient of -0.709. These results affirm the hypothesis (H_1) that higher capital adequacy is associated with lower levels of NPAs, suggesting that well-capitalized banks are better equipped to mitigate credit risk. The observed negative relationship between CRAR and NPAs underscores the importance of capital adequacy as a cornerstone of effective risk management practices in Mizoram's banks. Banks with higher CRAR levels, such as Mizoram Cooperative Apex Bank (MCAB) with a CRAR of 16.13% as of March 2021, demonstrate lower NPA ratios (2.18%).

- The analysis reveals a positive relationship between Credit Growth (CG) and Non-Performing Assets (NPA), as indicated by a coefficient of 0.158. This suggests that an increase in credit growth is associated with a rise in NPAs, but the effect is weak and not statistically significant, leading to partial support for hypothesis H_2 . This result deviates from prior research in the Indian context, such as Kaur and Kumar (2018), which reported a stronger association. It is possible that variations in risk exposure of the sampled banks could weaken the CG-NPA relationship compared to a more aggregated dataset compared to broader Indian studies like Kaur and Kumar (2018).
- The study identifies a positive and statistically significant relationship between Credit Deposit Ratio (CDR) and Non-Performing Assets (NPA), with a Beta coefficient of 0.509 and a p-value of 0.036 ($p < 0.05$). This indicates that a higher reliance on deposits to fund loans increases credit risk, with a 1% increase in CDR associated with a 0.509% rise in NPA. Deposits are typically short-term liabilities, while loans are long-term assets. A high CDR may reflect a mismatch in maturity profiles, exposing banks to liquidity risks if borrowers fail to repay on time. Studies like Dhar and Bakshi (2015) and Roy (2014) suggest that a positive and significant relationship may reflect systemic issues in the banking sector, such as reliance on deposit-driven growth without proportional improvements in risk management. The positive relationship may hold statistically, but its real-

world relevance for these banks could be minimal, as both CDR and NPA are already at low levels. A very low CDR suggests the bank is lending out a small fraction of its deposits, indicating conservative lending behavior. Similarly, a very low NPA reflects strong credit quality and effective risk management. The significant relationship might not indicate vulnerability for these banks but suggest that the studied banks operate in a "safe zone" where the risk is minimal.

- The study identifies a statistically significant negative relationship between Gross State Domestic Product (GSDP) and Non-Performing Assets (NPA) at the 1% significance level ($p < 0.01$). This indicates a robust association where higher economic output reduces loan defaults. A 1% increase in GSDP is associated with a 2.37% decrease in NPA. These findings suggest that economic growth, as measured by GSDP, is a critical factor in reducing NPAs, offering actionable insights for policymakers and banks aiming to enhance credit quality through economic development initiatives.
- The regression analysis reveals a negative relationship between Inflation (INF) and Non-Performing Assets (NPA), with a regression coefficient of -2.800. This relationship is statistically significant at the 1% level ($p < 0.01$). A 1% increase in INF is associated with a 2.80% decrease in NPA, demonstrating a substantial inverse impact. This suggests that rising inflation significantly reduces the level of non-performing loans. These findings directly contradict hypothesis H₅, which posited a positive relationship between INF and NPA.
- The analysis indicates a positive relationship between Credit Deposit Ratio (CDR) and Return on Assets (ROA), with a regression coefficient of 0.0090. However, this relationship is statistically insignificant, as evidenced by p-values of 0.250 (Ordinary Least Squares, OLS) and 0.198 (Generalized Least Squares, GLS), both exceeding the conventional 5% significance level ($p > 0.05$). This suggests that while a higher CDR may increase ROA, the effect is not robust enough to be statistically meaningful. Similarly, CDR exhibits a positive relationship with Return on Equity (ROE), with a coefficient of 0.273. However, this relationship lacks statistical significance, with p-values of 0.320 (OLS) and 0.335 (GLS), both well above the 0.05 threshold. The larger coefficient for ROE

(0.273) compared to ROA (0.0090) hints at a potentially stronger directional effect on equity returns, the high p-values indicate that this association is not significant. Bankers should not rely heavily on increasing CDR to boost ROA or ROE, as the data suggests no meaningful impact. Focus might shift to other levers, such as cost management or loan quality.

- The Capital to Risk-Weighted Assets Ratio (Log_CRAR) exhibits a statistically significant positive relationship with Return on Assets (ROA), with a coefficient of 1.6265. This is confirmed by p-values of 0.005 (OLS) and 0.002 (GLS), both well below the 5% significance level ($p < 0.05$). A unit increase in Log_CRAR is associated with a 1.6265-unit increase in ROA, indicating that higher capital adequacy substantially enhances profitability relative to total assets. However, Log_CRAR shows a positive but statistically insignificant relationship with Return on Equity (ROE), with a coefficient of 11.763. The p-values of 0.720 (OLS) and 47.029 (GLS) far exceed the 0.05 threshold. The findings highlight a clear divergence: Log_CRAR significantly boosts ROA but has no meaningful impact on ROE. This implies that while stronger capital buffers enhance asset efficiency, they do not translate into proportional gains for equity holders.
- The Non-Performing Assets (Log_NPA) shows a negative relationship with Return on Assets (ROA), with a coefficient of -0.007. This aligns with hypothesis H₆, which posits that higher NPAs reduce ROA. However, the relationship is statistically insignificant, with p-values of 0.977 (OLS) and 0.974 (GLS), both far exceeding the 5% significance level ($p > 0.05$). Log_NPA exhibits a positive relationship with Return on Equity (ROE), with a coefficient of 3.0190. This contradicts hypothesis H₇, which propose a negative relationship between NPAs and ROE. However, the p-values of 0.805 (OLS) and 17.767 (GLS) are well above 0.05, indicating no statistical significance. Across both ROA and ROE, and using both OLS and GLS estimation methods, Log_NPA does not demonstrate a statistically significant relationship with profitability.
- The survey data reveals a robust consensus among respondents regarding the bank's risk management framework. A strong majority (92.31%, $n = 144$) agree or strongly agree, with a median score of 4, that there is a common understanding

of risk management across the bank, suggesting a widely shared perception of its principles. Similarly, 88.46% (n = 138) affirm, with a median of 4, that responsibility for risk management is clearly defined and understood, indicating effective communication of roles and duties. Accountability is also well regarded, with 86.54% (n = 135) agreeing or strongly agreeing (median = 4) that it is clearly established, though this slightly lower figure compared to responsibility which could suggest a minor gap in enforcement clarity. An overwhelming 94.23% (n = 147) view managing risk as critical to the bank's performance and success (median = 5), underscoring its perceived priority, while an identical percentage (94.23%, n = 147) believe risk management techniques reduce costs or expected losses (median = 5), reflecting confidence in their practical benefits. Nearly all respondents (98.08%, n = 153) agree or strongly agree (median = 4) that the bank comprehensively and systematically identifies risks tied to its aims and objectives, and 96.15% (n = 150) affirm the same (median = 4) for identifying main potential risks, pointing to a thorough and focused risk assessment process.

- A significant 86.54% (n = 135) agree or strongly agree, with a median of 4, that there is a proper set of risk management guidelines, while 90.38% (n = 141) affirm the use of quantitative methods for risk assessment (median = 4), contrasting with a lower 67.31% (n = 105) for qualitative methods (median = 4), indicating a preference for data-driven approaches. Approximately 80.77% (n = 126) note that risk analysis includes cost-benefit assessments (median = 4), and 88.46% (n = 138) confirm the use of market risk models (median = 4), reflecting practical and specialized risk strategies. The existence of a written risk policy is supported by 80.77% (n = 126, median = 4), with 92.31% (n = 144) agreeing it is approved by the Board of Directors (BOD) (median = 4) and 84.62% (n = 132) noting periodic BOD reviews (median = 4), underscoring strong governance. Furthermore, 86.54% (n = 135) affirm that the policy is well-communicated (median = 4), and 82.69% (n = 129) agree it clearly defines roles (median = 4), suggesting effective dissemination and clarity.

- Our data on Performance-Based Risk Management (PBRM) indicates a strong positive perception of the bank's risk and liquidity management practices among respondents. A robust 92.31% (n = 144) agree or strongly agree, with a median of 4, that the bank identifies mediums to meet its funding requirements, while 88.46% (n = 138) affirm the existence of a contingency funding plan for liquidity (median = 4), suggesting effective liquidity planning. An even higher 96.15% (n = 150) confirms that reporting and communication processes support effective risk management (median = 4), reflecting exceptional strength in information flow. Management's periodic review of credit risk strategy is supported by 86.54% (n = 135, median = 4), indicating proactive oversight. Regarding the Basel Accord, 84.62% (n = 132) agree or strongly agree on its importance (median = 4), its significant impact on the bank (median = 4), and its improvement of risk management practices (median = 4), while 82.69% (n = 129) affirm sufficient IT arrangements to meet Basel requirements (median = 4), collectively demonstrating a positive view of regulatory alignment.
- The respondents regarding Risk Identification (RI) in a bank reveal a mixed picture of strengths and areas for improvement. A strong majority—82.69%—agree or strongly agree that the bank effectively recognizes changes in risk aligned with its roles and responsibilities and conducts a comprehensive and systematic identification of risks tied to its declared aims and objectives, both with a median score of 4. Similarly, 80.77% of respondents affirm that the bank has developed and applied procedures to systematically identify investment opportunities, also with a median of 4, indicating robust internal processes for both risk and opportunity recognition. However, perceptions are less favorable elsewhere: only 50% of respondents agree that the bank is aware of the strengths and weaknesses of other banks' risk management system and an equal 50% agree that the bank struggles to prioritize its main risks, both with a median of 3.5, suggesting uncertainty or inconsistency in these areas.
- The findings demonstrate a consistently high level of confidence in the bank's Risk Assessment and Management (RAM) practices, with agreement rates ranging from 75% to 100% across all 13 statements and median scores

predominantly at 4, with one at 4.5. Our data overwhelmingly affirms the bank's diligence in assessing borrower credibility and financial health, with 98.08% agreeing that the bank checks the credibility of borrowers' financial statements and gathers information on borrowers' credibility from other sources, while 94.23% agree that financial statements are analyzed. Similarly, 94.23% of respondents confirm the bank's good understanding of borrowers' sources of repayment. On the control and policy front, 96.15% agree that the level of control is appropriate for the risks, and an impressive 100% agree that the bank evaluates the effectiveness of existing controls and risk management responses. 98.08% agreeing that the bank has action plans for implementing decisions about identified risks. Regarding exposure and limits, 96.15% affirm that the bank has board-set exposure limits, though fewer—75%—agree that these limits align with the overall market risk management policy, marking the lowest agreement rate in the RAM table. Meanwhile, 84.62% agree that the bank reviews these limits in light of market conditions. Communication and adherence to credit policies are near-unanimous strengths, with 98.08% agreeing that the credit policy is properly communicated down the line and that the bank has manuals for credit evaluation and approval, while 100% confirm that the bank follows these manuals in letter and periodically reviews them.

- The findings reflect a broadly positive perception of the bank's Risk Management Process (RMP), with agreement rates ranging from 73.08% to 100% and a consistent median score of 4 across all 13 statements, indicating widespread agreement among respondents. The strongest endorsement comes for the statement that the bank has developed systems and procedures to institute an effective risk management framework, with 100% of respondents agreeing, suggesting a robust foundational structure for risk management. High agreement is also evident in routine monitoring and liquidity management, with 98.08% affirming that monitoring risk management is an integral part of routine management reporting and that consideration is given to external and internal factors posing liquidity risk while formulating policy, complemented by 94.23% agreeing that procedural manuals for liquidity management exist. Operational

and credit risk management also score well, with 90.38% agreeing that there is a separate function for operational risk management independent of internal audit, 88.46% confirming the use of credit derivatives to mitigate and eliminate credit risk, and 73.08% noting that credit risk is controlled on an integrated basis, though this latter figure represents the lowest agreement rate in the table. Organizational structure and oversight receive strong support, with 88.46% agreeing that the bank has an independent committee to identify and monitor various risks and that the internal auditor is responsible for examining risk management guidelines, systems, and reports, while 82.69% affirm that the board establishes operational risk tolerance levels and sets strategic direction. Continuous improvement is also well-regarded, with 82.69% agreeing that the bank is efficient in continuous review and feedback on risk management strategies and performance. However, areas with relatively lower agreement include the existence of a separate Risk Management Department (RMD) to ensure compliance with risk management policy, supported by 75%, and staff rotation within a reasonable time, endorsed by 84.62%, indicating potential gaps in organizational design or human resource practices.

- The findings indicate a highly favorable perception of the bank's Credit Risk Management (CRM) practices, with agreement rates ranging from 88.46% to 100%, reflecting strong confidence across all aspects surveyed. The bank excels in foundational and procedural areas, with 100% of respondents agreeing that before granting loans, a specific analysis of the client's character, capacity, collaterals, capital, and conditions is properly undertaken and that credit approval is conducted by the competent authority as per the bank's policy. Similarly, 98.08% affirm that the bank has a well-established credit rating process for all eligible cases as per its Risk Rating Policy, adheres to pre-set exposure limits for individuals or groups when sanctioning credit, undertakes regular review and renewal of its existing portfolio per norms, and has internal controls to avoid postponement of identifying Non-Performing Assets (NPAs). Governance and policy frameworks are also robust, with 92.31% agreeing that the bank has a well-designed credit risk policy and governance structure, while risk mitigation is

strongly supported, with 96.15% confirming the use of collaterals, insurance, and guarantees to safeguard loans and 88.46% noting the use of derivative products or hedging to mitigate credit risk. Monitoring and recovery mechanisms are well-regarded, with 88.46% agreeing that the bank employs optimal credit monitoring tools—such as financial due diligence, stock inspections, and early warning signals—during the loan’s currency, and 90.38% affirming the efficient use of recovery tools like the Credit Guarantee Scheme, SARFAESI, IBC, and civil suits. Additionally, 92.31% agree that timely reporting to credit information companies (CIC/CRILC) reduces default risk (Statement 13, median 4). A notable concern emerges with 92.31% agreeing that inadequate appraisal of borrowers’ creditworthiness is causing higher NPAs, suggesting a potential weakness despite the otherwise strong CRM framework.

- The findings reveal distinct differences in the perceived primary risks across the three banks—SBI, MRB, and MCAB—highlighting varying risk profiles. For SBI, with a sample of 53 respondents, Credit Risk is identified as the most significant by 28 individuals (52.94%), followed by Operational Risk at 19 respondents (35.29%), and Market Risks at 6 respondents (11.77%). This distribution suggests that while credit-related issues, such as loan defaults or inadequate borrower assessments, dominate concerns at SBI, operational challenges such as process failures or fraud, inadequate or unreliable electricity supply and internet connectivity and market risk such as competition from other banks also register as notable risks. In contrast, MRB, with a sample of 41 respondents, shows a unanimous perception, with all 63 respondents (100%) identifying Credit Risk as the most significant, and no respondents citing Operational Risk or Market Risks. Similarly, MCAB, with a sample of 29 respondents, also records a uniform view, with all 40 respondents (100%) pointing to Credit Risk, and none highlighting Operational Risk or Market Risks. The exclusive focus on Credit Risk at MRB and MCAB likely stems from their narrower operational focus—possibly regional or cooperative banking—where lending activities, particularly to potentially riskier agricultural or small-scale

borrowers, constitute the core business, amplifying the salience of credit-related challenges like non-performing assets (NPAs).

- The analysis of the Spearman's correlation between Understanding of Risks and Risk Management (URRM) and Risk Management Practices (RMP) yields a coefficient of 0.061 with a p-value of 0.452, indicating a very weak and statistically insignificant relationship based on a sample of 156 bank officers from selected banks in Mizoram. This result fails to support hypothesis H₁₂, which proposed that a higher level of risk understanding among bank officers would positively correlate with the adoption and effectiveness of risk management practices, as the near-zero correlation and high p-value (well above 0.05) provide no evidence for this expected association. Consequently, the findings suggest that there is no meaningful monotonic relationship either positive or negative between the two variables, implying that variations in officers' risk comprehension do not consistently align with changes in the implementation or success of risk management practices. This outcome contradicts previous studies that presumably identified a positive relationship between URRM and RMP. The lack of correlation could indicate that risk management practices in these banks are more heavily shaped by institutional policies or external mandates rather than the manager's knowledge from the field.
- The Spearman's correlation analysis between Availability of Resources for Risk Management (ARRM) and Risk Management Practices (RMP) yields a coefficient of 0.252 and a statistically significant p-value of 0.002 ($p < 0.1$), indicating a positive and weak relationship between the two variables. This positive correlation aligns with Costello and Minnis (2024), suggesting that banks with greater resource availability tend to adopt and implement risk management practices more effectively, as increased resources—such as funding, staff, or technology—enhance the quality or extent of these practices. However, following Myers and Well (2003) and Siegel and Castellan (1988), a Spearman's ρ of 0.252 denotes a weak positive relationship, implying that while resource availability contributes to better risk management, the effect is moderate. Nevertheless, the statistically significant result supports hypothesis H₁₃, which

posits that greater availability of resources for risk management in banks is positively associated with the adoption and effectiveness of risk management practices. The findings suggest that while resources play a role in strengthening risk management, other factors—such as organizational priorities or external constraints—may also influence RMP, reducing the strength of this relationship. Thus, the evidence confirms a positive relationship between resource availability and risk management efficacy, although one that is moderately strong, highlighting the need for a balanced approach to resource allocation in enhancing bank risk management practices.

- The Spearman's correlation analysis between Perceptions of Bankers towards Risk Management (PBRM) and Risk Management Practices (RMP) reveals a coefficient of 0.589, indicating a moderately strong and positive relationship, with high statistical significance at the 0.01 level (2-tailed). This robust monotonic relationship suggests that as bankers' perceptions of risk management practices become more positive, there is a corresponding improvement in the adoption and effectiveness of these practices, with a notable effect size reflecting a meaningful connection. The strength of the correlation (0.589) implies that bank officers' optimism or confidence in risk management significantly influences the quality and implementation of RMP, likely fostering a supportive environment for risk management initiatives. This finding supports hypothesis H₁₄, which states that a positive perception of bankers toward risk management practices is positively associated with the adoption and effectiveness of overall risk management practices. These results highlight the importance of cultivating positive perceptions among bank officers, as their attitudes appear to act as a critical factor in enhancing the practical application and outcomes of risk management strategies.
- The Spearman's correlation analysis between Risk Identification (RI) and Risk Management Practices (RMP) yields a coefficient of 0.109, indicating a very weak positive relationship, as classified by Myers and Well (2003), and a statistically insignificant p-value of 0.176 (not significant at $p < 0.05$ or $p < 0.01$). This suggests no meaningful monotonic relationship between effective risk

identification and the implementation or success of risk management practices within the sampled banks, as changes in RI do not consistently correspond to improvements in RMP. The very weak and insignificant correlation contrasts with prior literature, such as Allen and Saunders (2012) and Acharya and Richardson (2010), which presumably emphasized a stronger link between robust risk identification and effective risk management. Consequently, hypothesis H₁₅, which posits that effective risk identification is positively associated with the implementation and success of risk management practices, is not supported by this sample. The lack of a significant relationship may indicate that risk identification, while foundational, does not directly translate into enhanced risk management practices in this context. This could potentially be due to intervening factors like resource limitations, organizational disconnects, or differences in how RI and RMP are executed or perceived. These findings suggest that the banks in this study may need to re-evaluate how risk identification integrates with broader risk management efforts, as its effectiveness appears to have minimal bearing on the overall success of RMP, challenging established expectations from existing research.

- The Spearman's correlation analysis between Risk Analysis and Monitoring (RAM) and Risk Management Practices (RMP) reveals a coefficient of 0.450, indicating a moderately strong and positive relationship, with high statistical significance at the 0.01 level (2-tailed). This robust monotonic relationship suggests that as officers' capabilities in risk analysis and monitoring improve, there is a corresponding enhancement in the quality and success of risk management practices, supported by a substantial effect size. Classified as moderately strong by Myers and Well (2003), this correlation aligns with existing literature, such as Jorion (2007) and Costello and Minnis (2024), which highlights risk analysis and monitoring as foundational to effective risk management. The findings indicate that stronger RAM practices directly contribute to the successful implementation and effectiveness of RMP, reflecting their critical role in the risk management framework. Thus, hypothesis H₁₆, which states that robust risk analysis and monitoring are positively associated

with the implementation and effectiveness of risk management practices, is supported by this sample. This moderately strong relationship underscores the importance of investing in analytical and monitoring capabilities among bank officers, as these skills appear to significantly strengthen the overall risk management process, consistent with previous studies and reinforcing their practical relevance in banking operations.

- The Spearman's correlation analysis between Credit Risk Management (CRM) and Risk Management Practices (RMP) yields a coefficient of 0.508, indicating a moderately strong and positive relationship, with high statistical significance at the 0.01 level (2-tailed). This robust monotonic relationship suggests that as bankers' perceptions of credit risk management practices improve, there is a corresponding enhancement in the adoption and effectiveness of overall risk management practices, supported by a substantial effect size. Classified as moderately strong by Myers and Well (2003), this correlation aligns with prior research, such as Chu and Ng (2023) and Altman and Saunders (1997), which suggest that confidence in credit risk tools—such as appraisal, monitoring, and mitigation strategies—drives broader risk management outcomes. The findings indicate that a favorable view of CRM among officers significantly bolsters the quality and implementation of RMP, likely due to credit risk being a fundamental component of banking operations that influence overall risk frameworks. Consequently, hypothesis H₁₇, which states that a positive perception of bankers toward credit risk management practices is positively associated with the adoption and effectiveness of overall risk management practices, is supported by this study.
- The Kruskal-Wallis H test results provide evidence that perceptions of Risk Management Practices (RMP) vary significantly across bank officers from different institutions, supporting hypothesis H₁₈, which states that "the perception of risk management practices varies significantly among bank officers across selected banks." With a χ^2 value of 6.205 and a p-value of 0.045 ($p < 0.05$), the statistically significant difference indicates distinct institutional influences on RMP perceptions. The mean ranks further illustrate this variation, with SBI

officers scoring the highest at 87.09, followed by MCAB at 77.39, and MRB at 71.98, suggesting that SBI officers hold the most positive perceptions of RMP, potentially reflecting stronger resources, infrastructure, or training at SBI. In contrast, the test for Credit Risk Management (CRM) perceptions fails to support hypothesis H₂₁, which posits that "the perception of credit risk management practices varies significantly among bank officers across selected banks." Here, a χ^2 value of 1.524 and a p-value of 0.467 ($p > 0.05$) indicate no significant difference, pointing to uniformity in CRM perceptions across the banks. The mean ranks show SBI again leading at 83.76, followed by MCAB at 76.70, and MRB at 75.21, suggesting a similar trend of SBI officers perceiving CRM most positively, though the differences are not statistically significant. These findings highlight that while institutional context shapes broader risk management perceptions—likely due to varying operational scales or organizational focus—it does not significantly differentiate perceptions of credit risk management, possibly due to standardized credit policies.

- The Mann-Whitney U test results indicate no statistically significant gender-based differences in perceptions of Risk Management Practices (RMP) and Credit Risk Management Practices (CRM) among bank officers. For RMP, the p-value of 0.064 exceeds the conventional significance threshold of 0.05, suggesting that the difference in perceptions between male and female officers is not significant at the 5% level. Despite this, the mean rank for female officers (83.96) surpasses that of male officers (74.17), hinting that females, on average, perceive RMP more positively than their male counterparts, though this difference lacks statistical backing. Consequently, hypothesis H₁₉, which posits that "male bank officers perceive risk management practices more positively than female bank officers," is not supported, as the data leans slightly in the opposite direction without reaching significance. Similarly, for CRM, the p-value of 0.793 is well above 0.05, indicating no significant difference in perceptions between genders. The mean rank for females (79.41) is marginally higher than for males (77.78), suggesting a slight tendency for female officers to view CRM more favorably, but this difference is also statistically insignificant. Thus, hypothesis

H₂₂, which states that "male bank officers perceive credit risk management practices more positively than female bank officers," is not supported either. These findings suggest a broad alignment in how male and female bank officers perceive both RMP and CRM, with females showing a slight, non-significant edge in positivity. This lack of significant gender variation implies that perceptions of risk management practices in this sample are likely shaped more by institutional or professional factors than by gender, offering a basis for uniform training or policy approaches across genders to enhance risk management effectiveness.

- The analysis of bankers' perceptions of Risk Management Practices (RMP) across work experience groups reveals that officers with "More than 30 years" of experience have the highest mean rank (86.30), followed by those with "Between 20 and 30 years" (80.39), while the "Less than 5 years" group records the lowest mean rank (72.55), suggesting a trend where greater experience correlates with more positive perceptions of RMP. However, with a p-value of 0.640—well above the conventional significance threshold of 0.05—the difference across these groups is not statistically significant, indicating that experience does not reliably influence RMP perceptions in a meaningful way. Consequently, hypothesis H₂₀, which states that "bank officers with greater work experience perceive risk management practices more positively than those with less work experience," is not supported. Similarly, for Credit Risk Management (CRM) perceptions, the "More than 30 years" group again leads with the highest mean rank (91.50), followed by "Between 5 and 10 years" (85.09), but the pattern is inconsistent, as the "Less than 5 years" group (76.00) outranks the "Between 10 and 20 years" group, undermining a clear linear relationship between experience and CRM perceptions. The p-value of 0.170, also above 0.05, confirms no statistically significant difference across the experience groups, suggesting that perceptions of CRM are not substantially shaped by years of service. Thus, hypothesis H₂₃, which posits that "bank officers with greater work experience perceive credit risk management practices more positively than those with less work experience," is not supported. These findings indicate that while more

experienced officers tend to rank both RMP and CRM more positively on average, the differences lack statistical significance and consistency, pointing to other factors—such as training, institutional culture, or role-specific exposure—potentially outweighing work experience in shaping risk management perceptions among these bankers.

5.2 Recommendations

Based on the insights and findings presented, the following recommendations are proposed to address key challenges and optimize outcomes. These suggestions aim to leverage identified opportunities, mitigate potential risks, and provide a clear path forward for effective decision-making and implementation:

5.2.1 Recommendations for Bank Management:

- **Identify an Optimal CRAR Threshold:** The studied bank i.e., Mizoram Rural Bank (MRB) and Mizoram Cooperative Apex Bank (MCAB) should conduct internal stress testing and risk assessments to determine a CRAR level that best mitigates NPAs while supporting lending capacity. Banks should aim for a threshold that suits their unique risks exposure and operational climate.
- **Strengthen Capital Buffers:** Banks with CRAR levels below such identified threshold should prioritize capital augmentation through retained earnings, equity infusions, or asset optimization to reduce reliance on external recapitalization and enhance resilience against credit risk.
- **Integrate CRAR-NPA Monitoring:** The bank may establish real-time dashboards to track the CRAR-NPA relationship, leveraging the observed negative relationship to guide strategic decisions on capital allocation and loan provisioning.
- **Address Maturity Mismatches:** Given that high CDR may signal liquidity risks from mismatched short-term deposits and long-term loans, banks should diversify funding sources (e.g., long-term borrowings) and align loan tenures with deposit profiles to reduce exposure to repayment delays.

- **Promote Targeted Lending:** Conservative bank like SBI is encouraged to cautiously increase lending in underserved sectors (e.g., agriculture or MSMEs in Mizoram), leveraging their position as the bank with the largest resources as a buffer. The bank can expand credit while monitoring the CDR-NPA relationship to stay within the "safe zone."
- **Study Optimal Credit Expansion Limits:** Bank should determine the point at which credit growth begins to meaningfully increase NPAs. This could identify the thresholds where risks incurred from credit increases across loan portfolios outweigh benefits; ensuring growth aligns with the bank's low-NPA strengths.
- **Link Lending Strategies to Economic Trends:** Banks should study how to align credit expansion with GSDP growth, identifying sectors most responsive to economic upturns in their operational region. This could involve analyzing historical loan performance during GSDP fluctuations to optimize portfolio allocation.
- **Adapt Lending Policies to Inflation Trends:** Bank management should investigate optimal lending strategies under rising inflation, analyzing whether targeting inflation-sensitive sectors amplifies the NPA reduction effect; ensuring policies align with this NPA and INF relationship.
- **Investigate CDR's Limited Profitability Impact:** Banks should analyze why even though CDR has a positive effect on ROA (0.0090) and ROE (0.273) but lacks significance. The bank should examine whether factors like high operating costs, low loan yields, or conservative lending weaken its influence.
- **Emphasize Operational Improvements:** Given that the study identifies a weak NPA-profitability relationship, management should research non-NPA factors—such as cost efficiencies, asset utilization, or customer retention—to drive ROA and ROE.
- **Tailor Risk Mitigation Strategies:** The 100% focus on Credit Risk by respondents from MRB and MCAB does not necessarily indicate lower exposure to Operational or Market Risks; instead, it likely stems from their concentration on high-risk groups such as agricultural or small-scale borrowers. This suggests

that risk mitigation strategies for MRB and MCAB should be specifically tailored to these lending profiles.

- **Account for Competitor Operations in Rural Expansion:** When planning expansion into rural areas, bank management should evaluate the presence and operations of existing banks, as respondents citing market competition from other banks were often from branches established later than their competitors. This suggests that earlier-established banks already serve the region, potentially saturating the limited rural population. New branches may face challenges similar to the "Tragedy of the Commons," where finite resources—such as a small customer base—are overstretched, leading to diminished returns.
- **Optimize Resource Allocation:** While greater resource availability positively influences risk management practices, the weak correlation suggests diminishing returns beyond a certain point. Bank managers should prioritize efficient allocation of resources rather than simply increasing them, focusing on high-impact areas such as advanced risk assessment tools or staff training.
- **Foster Positive Perceptions through Training:** The moderately strong correlation suggests that bankers' attitudes significantly influence risk management practices. Management should invest in regular training programs to enhance understanding and confidence in risk management, emphasizing its value to the bank's stability and success.
- **Bridge the Gap between RI and RMP:** The lack of a significant relationship between Risk Identification (RI) and Risk Management Practices (RMP), despite a high level of RI, suggests that while bank officers in the field are proficient at identifying risks, management may not be effectively listening to or acting on their insights. To address this disconnect, management should review and reinforce the processes that connect risk identification to actionable strategies, ensuring that the risks identified by officers directly and effectively inform and shape RMP.
- **Enhance CRM Training and Tools:** The moderately strong correlation ($\rho = 0.508$) suggests that positive perceptions of CRM significantly improve RMP. Management should invest in training programs and advanced tools (e.g., credit

scoring models, real-time monitoring systems) to boost officers' confidence and competence in CRM.

5.2.3 Recommendations for Policymakers:

- **Support Customized CRAR Benchmarks:** While upholding the 9% minimum CRAR for scheduled commercial banks, the RBI should promote the adoption of higher, customized thresholds that account for the distinct risks each bank faces, based on their organizational focus. India's vast and diverse banking sector—spanning rural, cooperative, and commercial entities—cannot be effectively served by a uniform threshold. Instead, the RBI should provide guidelines encouraging banks to simulate CRAR levels based on their exposure to specific risk profiles and NPA scenarios; ensuring capital adequacy aligns with regional and operational realities.
- **Facilitate Targeted Recapitalization:** The government should allocate recapitalization funds to the public-sector banks that fall short of the required CRAR benchmark, linking disbursements to a commitment to achieve and maintain an optimal, self-determined CRAR threshold above the minimum requirement.
- **Encourage Risk Management Education:** Facilitate training programs that serve as a platform for bank officers from different institutions to share experiences and learn from each other. Participants can explore best practices in risk mitigation, adapt strategies to regional challenges, discover innovative capital management techniques, share approaches to regulatory compliance, and exchange crisis management lessons.
- **Boost Deposit Mobilization:** The government should promote and support initiatives to increase deposit inflows in Mizoram and NER banks through financial literacy campaigns and rural banking outreach, providing a larger base for lending and reducing reliance on existing deposits, which could ease CDR pressures.
- **Evaluate Systemic CDR Risks(over-reliance on deposits):** Policymakers should investigate whether the CDR-NPA link reflects broader systemic issues in

Mizoram. The study could test interventions, such as subsidized long-term funding, to reduce maturity mismatches and support sustainable credit growth.

- **Fund Infrastructure for Credit Demand:** The government could invest in Mizoram's economic infrastructure such as agriculture and tourism to stimulate credit demand, enabling banks to raise CDR organically without overextending risk, given the Mizoram's CDR during the study period is 45.7% versus the national 72.1%.
- **Set Region-Specific CDR Guidelines:** Recognizing the region's low CDR (45.7%) compared to the national average (72.1%), the RBI should establish flexible, region-specific CDR targets that account for Mizoram's economic context and conservative lending culture. For instance, a well calculated target range could encourage growth without triggering systemic risks highlighted by studies like Dhar and Bakshi (2015).
- **Enhance Priority Sector Compliance:** The RBI's existing guidelines for priority sector lending provide a framework to boost credit flow, but enforcement needs strengthening. The RBI should rigorously monitor whether banks are achieving these targets and validate reported data against actual outcomes, ensuring that increases in CDR toward a sustainable level align with priority sector goals while maintaining NPA ratios at a safe level. This approach will promote balanced growth and ensure compliance reflects reality.
- **Incentivize Balanced Growth:** The RBI should offer incentives tied to priority sector lending, such as reduced statutory liquidity ratio (SLR) requirements or additional benefits. This focus on priority sectors will drive economic activity in underserved areas while encouraging balanced credit growth.
- **Evaluate Economic Interventions for NPA Reduction:** Policymakers should initiate studies to test which GSDP-boosting initiatives such as infrastructure projects, MSME support, etc., most effectively lower NPAs, quantifying their impact to guide resource allocation.

5.2.3 Recommendations for Entrepreneurs:

- **Entrepreneurs should support themselves with quantitative evidence:** With 90.38% of respondents confirming the bank's use of quantitative methods for risk assessment, entrepreneurs should strengthen their credit applications with quantitative proof of creditworthiness—such as detailed business plans, verified cash flow statements, and data demonstrating their capacity to repay loans. This combination can strengthen their financial planning, like optimizing loan repayment schedules or investment timing, aligning their proposals with the bank's analytical precision.
- **Enhance financial documentation:** Enhancing financial documentation is crucial for rural entrepreneurs to overcome banks' stringent credit policies, as the result emphasizes rigorous scrutiny of borrowers' financial statements (98.08% agreement among bank officers). As 98.08% among the bank officers agreed to have gathered information on the credibility of borrowers, maintaining even basic records—such as income from agriculture or small trades—can demonstrate repayment capacity. Rural entrepreneurs should pursue training in bookkeeping and assistance to prepare reliable financial statements, ideally maintaining a bank account with recorded transactions to substantiate their income. This aligns with banks' reliance on verified financial data, increasing loan approval chances under priority sector lending and bridging the gap created by informal rural economies.
- **Leverage Government Schemes:** Rural entrepreneurs can significantly benefit from leveraging government schemes like the *Deendayal Antyodaya Yojana* - National Rural Livelihood Mission (DAY-NRLM) or PMEGP to counter banks' stringent credit criteria. With bank officers adhering fully to credit manuals (100% agreement), these schemes offer a structured pathway to eligibility, often supplemented by subsidies that reduce financial risk for both borrowers and lenders. Entrepreneurs should proactively consult bank officials to understand specific requirements and align their applications accordingly. By tapping into these programs, which target priority sectors like agriculture and weaker sections, they can offset the high scrutiny on repayment capacity (94.23%) and limited

collateral, enhancing access to subsidized credit and fostering economic resilience.

- **Build External Credibility:** Rural entrepreneurs can enhance their creditworthiness by establishing repayment reliability through Self-Help Groups (SHGs) or cooperatives, leveraging banks' heavy reliance on external information sources (98.08% agreement). Participation in these groups allows consistent repayment histories to be documented, serving as an alternative credibility marker for banks wary of low rural incomes. Additionally, taking small credit facilities, such as credit cards or microloans, and repaying them promptly can gradually improve credit scores. This strategy builds a formal financial track record, addressing banks' stringent risk analysis (98.08% credibility checks) and boosting loan approval prospects under priority sector norms.
- **Financial Literacy:** Rural entrepreneurs should prioritize attending financial literacy training programs to gain a deeper understanding of banks' credit policies, which are effectively communicated down the line (98.08% agreement among bank officers). With banks adhering strictly to credit evaluation processes (100% manual adherence), these programs can equip entrepreneurs with the knowledge to navigate complex approval requirements. Understanding terms like repayment obligations, interest rates, and eligibility criteria empowers them to present stronger loan applications, addressing the high scrutiny on financial credibility (98.08%). Enhanced literacy bridges the gap between rural borrowers' limited resources and banks' stringent standards, improving credit access under priority sector lending.
- **Collaborate with Bankers:** Rural entrepreneurs should actively engage with bank officers to customize loan applications within the exposure limits set by bank boards (96.15% agreement). Proactive collaboration allows borrowers to address risk concerns—such as low income (Rs. 1,346.35 monthly) or lack of collateral—upfront, aligning their proposals with banks' risk management frameworks (100% control effectiveness evaluation). By discussing needs and repayment plans directly, entrepreneurs can leverage officers' insights into credit

policies (98.08% communication) to meet stringent criteria. This partnership mitigates the high credit risk perception in priority sector lending, enhancing approval chances and fostering a supportive banking relationship for rural economic growth.

5.2.4 Recommendations for Future Researchers:

- **Define the 'Safe Zone' Parameters:** Future studies should quantify the "safe zone" where low CDR and NPAs coexist with minimal risk, testing ranges across banks. Regression analysis could identify the range where CDR increases significantly elevate NPAs, offering a benchmark for conservative banking strategies nationwide.
- **Dissect Sectoral Contributions to GSDP-NPA Link:** Researchers should examine which sector most strongly influenced the NPA drop, analyzing detailed data to uncover sector-specific effects and refine economic development strategies.
- **Combine Quantitative and Qualitative Methods:** Future researchers should combine quantitative and qualitative methods to provide a more comprehensive understanding of Risk Management Practices (RMP) and Credit Risk Management (CRM) perceptions among bank officers. Incorporating qualitative methods—such as semi-structured interviews, focus groups, or open-ended surveys—alongside quantitative data would enable researchers to explore the "why" and "how" behind the quantitative outcomes

5.3 Limitations of the study

- **Geographic Scope:** The study is confined to Mizoram, limiting its generalizability to regions with different economic and banking contexts.
- **Sample Size:** The primary data sample of 156 officers may restrict the statistical power to detect nuanced differences in perceptions, especially across demographic groups.

- **Data Period:** Secondary data (2012–2021) may not fully reflect post-COVID economic shifts or recent regulatory changes, potentially affecting findings' relevance.
- **Self-Reported Data:** Reliance on questionnaires introduces potential response biases, such as social desirability, which may skew officers' perceptions of risk management practices.
- **Quantitative Focus:** The emphasis on quantitative methods may overlook qualitative insights into risk management dynamics, limiting depth of understanding.
- **Bank Selection:** Focusing solely on SBI, MRB, and MCAB excludes private banks, potentially missing diverse risk management strategies

5.4 Conclusion

This study highlights the critical role of robust capital adequacy (CRAR) and economic growth (GSDP) in reducing NPAs among Mizoram's banks, with higher CDR increasing credit risk. Positive banker perceptions and effective risk analysis significantly enhance risk management practices, though understanding and risk identification show limited impact. Tailored strategies, leveraging regional economic trends and training, are essential for strengthening banking resilience. The findings underscore the need for region-specific policies to address Mizoram's unique banking challenges.

These findings also carry important implications in the context of the United Nations Sustainable Development Goals (SDGs). Sound credit risk management and strong banking governance support SDG 8 (Decent Work and Economic Growth) by ensuring that financial institutions remain stable and capable of extending continuous and responsible credit to productive sectors. Strengthened risk frameworks and institutional capacity further contribute to SDG 9 (Industry, Innovation and Infrastructure) by enabling safer financing of enterprises and development activities. Importantly, improved access to well-managed banking services also advances SDG 5.a, which emphasizes women's equal rights to economic resources and access to financial services, by promoting inclusive and responsible lending systems that can

better serve women borrowers and entrepreneurs. In addition, transparent and accountable banking risk practices align with SDG 16 (Strong Institutions) and support SDG 10 (Reduced Inequalities) through safer and more inclusive financial outreach. Thus, effective risk management in banking not only strengthens institutional resilience but also contributes directly to inclusive and sustainable development outcomes.

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ANNEXURES

Questionnaire

CONTROL INSTRUCTIONS

This questionnaire aims to study the Risk Management Practices among SBI, RRB and MCAB in Mizoram. The information is required in connection with doctoral research work. The data will be used for academic purpose only. Anonymity of respondents as well as confidentiality of the information will be maintained. After reading each statement you have to provide your valuable answer.

PART- A DEMOGRAPHIC PROFILE (7)

Name (Optional):

.....

1. Bank Name : SBI ☐ MRB ☐ MCAB ☐

2. Gender : Male ☐ Female ☐

3. Age :.....

4. Qualification :.....

5. Designation :.....

6. Location of current post : Urban ☐ Semi-Urban ☐ Rural ☐

7. Work experience (In Years)
:.....

Part – B Variables of Risk Management Practices (56)

A.Understanding Risk and Risk Management (7)

S.no	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	There is a common understanding of the risk management across the bank.					
2	Responsibility for risk management is clearly set out and understood by bank.					
3	Accountability for risk management is clearly set out and understood by bank.					
4	Managing Risk is important to the performance and success of the bank.					
5	Application of risk management techniques reduce cost or expected loss.					
6	The bank carries out a comprehensive and systematic identification of its risk relating to each of its declared aims and objectives.					

7	The bank identifies the main potential risks relating to each of its declared aims and objectives.					
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B. Availability of Resources for Risk Management in Public-Sector Banks (10)

S.no	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	There is a proper set of guidelines for managing risk.					
2	Risks are assessed by using quantitative methods.					
3	Risks are assessed by using qualitative methods.					
4	Risks analysis of your bank includes assessment of the cost and benefits of addressing risk.					
5	My bank uses model for market risk assessment					
6	My bank has an establishment of a Written Risk Policy					
7	My bank Risk Policy is duly approved by the Board of Directors (BOD).					
8	My bank BOD periodically reviews the Risk Strategy					
9	In my bank, Policy has been properly communicated down the line.					
10	In my bank, Policy clearly spells out the roles of individuals.					

C. Perception of Bankers towards Risk Management (8)

S.no	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Bank identify the means to meet its funding requirement					
2	Bank has contingency funding plan for liquidity					
3	Reporting and communication processes support the effective risk management.					
4	Management periodically review the credit risk strategy					
5	The implementation of Basel accord in banking sector is very important.					
6	The application of Basel accord has a significant impact on the bank.					
7	The Basel Accord has improved the Risk management practices of the bank.					
8	The bank has sufficient IT arrangements to meet the requirements of Basel Accord.					

D. Risk Identification (5)

S.no	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Changes in risk are recognized and identified with the bank's roles and responsibilities					
2	My bank is aware of the strengths and weaknesses of the risk management systems of other banks.					
3	The Bank finds it difficult to prioritize as main risk.					
4	The bank carries out a comprehensive and systematic identification of its risks relating to each of its declared aims and objectives					
5	My bank has developed and applied procedures for the systematic identification of investment opportunities					

E. Risk Analysis & Monitoring (13)

S.no	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
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1	Check the credibility of financial statements of borrowers					
2	Analyze the financial statements of borrowers					
3	Gather information on borrowers' credibility from other sources					
4	The level of control is appropriate for the risks					
5	Evaluation of the effectiveness of the existing controls and risk management responses.					
6	Action plans for implementing decisions about identified risk.					
7	Bank have a good understanding of borrowers' source of repayment					
8	Bank have exposure limits set by the board					
9	Bank ensures that these limits are commensurate with the overall market risk management policy					
10	Bank review these limits in view of market conditions					

11	Credit policy been properly communicated down the line					
12	Banks have manuals for credit evaluation and approval					
13	Bank follows the credit manuals in letter and periodically reviews these manuals?					

F. Risk Management Practices (13)

S.no	Statements	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
1	Monitoring the risk management is an integral part of routine management reporting.					
2	Consideration given to staff rotation within a reasonable time					
3	Separate function of operational risk management, independent of internal audit					
4	Consideration to external and internal factors posing liquidity risk while formulating the policy.					

5	Procedural manuals for liquidity management					
6	Separate Risk Management Department (RMD) exists to ensure compliance with risk management policy.					
7	Bank is using Credit Derivatives for mitigating and Eliminating Credit Risk.					
8	Credit Risk is controlled on an integrated basis					
9	Developed systems and procedures to institute effective risk management framework					
10	The bank has an independent committee to identify, monitor the various risks.					
11	Efficient in continuous review/feedback on risk management strategies and performance.					
12	The internal auditor has the responsibility to examine the risk management guidelines, systems and reports.					
13	The board establishes					

	operational risk tolerance level and set strategic direction in relation to operational risk					
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G. Perceptions of bank officers of credit risk management practices (13)

S.no	Statements	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
1	The Bank is having a well-designed credit risk policy and well-established governance structure for credit risk management					
2	Inadequate appraisal of borrower's credit worthiness is causing higher NPAs.					
3	The Bank undertakes credit rating in all eligible cases as per Risk Rating Policy of the bank.					
4	Before granting loans, the Bank undertakes a specific analysis including the client's character, capacity, collaterals, capital and conditions properly.					
5	The competent authority is doing Credit approval as decided by the bank in policy					
6	The Bank is having pre-set norms on exposure limit to individual or group and same is adhered while sanctioning the credit proposal.					
7	Risk Mitigates in the form of collaterals, insurance and guarantee is taken to safeguard the loan.					

8	The Bank undertakes regular review / renewal of existing portfolio as per norms of the bank.					
9	In order to mitigate the credit risk bank is using derivative products / hedging.					
10	There are internal controls to avoid postponement of identification of NPAs.					
11	The Bank is having optimal Credit Monitoring Tools viz., Financials due diligence, Stock Inspection, MSOD (Monthly Statement of Operational Data), QPRs (Quarterly Prudential Return), Early Warning Signals etc. and utilizing the same during the currency of loan.					
12	The Bank is having optimal credit recovery tools viz., Credit guarantee scheme, SARFAESIA, IBC / DRT / DRAT/ CIVIL Suit / RC etc. and utilizing them efficiently as and when needed.					
13	Reporting to CIC / CRILC/ Other agencies in time resulted in lesser risk of default by borrower.					

QUESTIONNAIRE

He Questionnaire in a tum ber chu Mizoram Bank-a Risk Management Practices zirchian a ni a, heta tanga information kan dawn zawngzawng hi doctoral research work (PhD) atanchauhahman tur a ni. He Questionnaire min chhansaktutenihna (identity) hriattheihturinemaw, an thawhna bank tihmingchhethetzawnginengmahtih a nilo ang.

CONTROL INSTRUCTIONS

Risk:Kan beiseilohlehkan duh dan nilo a thil lo thlengthei. Entirnan: Bank loan latu ten beiseianga loan an rulhtheihlohemaw, cash counter a pawisachhut/chhiarsualte, forged instruments (entirnan: cheque ruk/pawisalem) lo dawn palhte, clerical error (data entry tihsual, account link sualpalh, account nilo a pawisa credit emaw debit palh), ATM-in a pawisa a pekchhuah dan diklo, Mortgage (dahkham) hlutna lo tlahniamtelehadangte a huam a ni.

He Questionnaire hi a chhangtungaihdan kha chhannadik ani a, chhannadiklehdik lo a awmhran lo ani. Tha taka min chhansaktheihchuan ka lawmhle ang.

Regards

Albert Lalrinsanga Hauhnar
Research Scholar
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Mizoram University
Mob: 8794559486

PART- A DEMOGRAPHIC PROFILE (7)

1. Bank Name :
2. Type of Ownership: Public Private Foreign
3. Gender : Male Female
4. Age :.....
5. Qualification :.....
6. Designation :.....
7. Location of current post : Urban ☐ Semi-Urban ☐ Rural ☐
8. Work experience (In Year) :.....
9. In Branch in harsatna in tawh zin berpakhatthlanngai ta se, khawi hi ngeni ang?
Loan la tu ten loan an rulhmumalloh vanga harsatna. ☐
Pawisa deposit leh withdrawal diklo, network mumal lo leh clerical error. ☐
Bank dang nen a competition vanga harsatna. ☐
Others(Please Specify)

Part – B Variables of Risk Management Practices (56)

A. Understanding Risk and Risk Management (7)						
S.no	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Bank staff-ten risk management chungchangkanhrethiamtlang.	SD	D	N	A	SA
2	Risk management chungchangamawhphurthu hi chiang takin bank-in a tarlang a, staff ten kanhrethiambawk.	SD	D	N	A	SA
3	Risk management feltawklohavang a Loss a lo awmin, mawh la tu tur hi chiangtak a tarlan ani a, staff-ten kanhrethiambawk.	SD	D	N	A	SA
4	Bank performance thatnaatanRisk Management hi a pawimawhhe.	SD	D	N	A	SA
5	Risk management tha taka kalpui a nihchuanLoss a tlemphahthin.	SD	D	N	A	SA
6	Bank hian a objectives tihhlawhtlinnakawng a risk awmtheitekim chang taklehuluk takin a zirchiangthin.	SD	D	N	A	SA

7	Bank staff-tehiankannitinhnathawh a risk awmtheite chu kanhrechianghle.	SD	D	N	A	SA
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B Availability of Resources for Risk Management (10)

S.no	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Risk hmachhawn dan turahinkaihrruainamumaltak a awm.	SD	D	N	A	SA
2	Risk te hi <i>quantitative method</i> hmangateh a niber. (quantitative example: kan information hmuhtheihlehhriattheih)	SD	D	N	A	SA
3	Risk te hi <i>qualitative method</i> hmangateh a ni. (qualitative example: Mihringmizia)	SD	D	N	A	SA
4	Bank-a risks analysis-ah hian risk hmachhawndanah <i>cost and benefits assessment</i> tehna a tel a ni.	SD	D	N	A	SA
5	Kan bank hian <i>market risk assessment model</i> mumaltak a hmanthhin.	SD	D	N	A	SA
6	Kan bank hian <i>Risk Policy</i> ziakinmumaltakkanne i.	SD	D	N	A	SA
7	Kan Branch Risk Policy hi thuneitu sang Board of Directors (BOD)pawmpui a ni.	SD	D	N	A	SA
8	Kan Branch Risk Policy hi thuneitu sang Board of Directors (BOD) ten hunbineiin an <i>review</i> thin.	SD	D	N	A	SA
9	Kan bank-ah chuan Policy hi mumaltak a inhrilhhriatthin a ni.	SD	D	N	A	SA

10	Kan bank-ah chuan Policy hianmimalchanvochiang takin a tarlang.	SD	D	N	A	SA
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C. Perception of Bankers towards Risk Management (8)

S.no	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Kan Bank chuan funding ah harsatnakantawblem lo.	SD	D	N	A	SA
2	Risk hranghrangavangapawisa a harsatna a awmthulhatankan bank chuan contingency funding plan mumaltakkannei ani.	SD	D	N	A	SA
3	Reporting leh communication process felfaitak a awmhian, risk lakahnasa takin kan him phah ani.	SD	D	N	A	SA
4	Risk lakakan in ven dan (risk strategy) hi hunbineiinkanhotu ten an review thin.	SD	D	N	A	SA
5	Banking sector-a Basel accord kalpui hi a pawimawhhle.	SD	D	N	A	SA
6	Basel accord hian bank-ah nghawngthatak a nei a ni.	SD	D	N	A	SA
7	Basel Accord hian bank-a Risk management kalphung a tichangtlung	SD	D	N	A	SA

	(improve)hle.					
8	Bank hian Basel Accord kalpuiturin <i>IT facility</i> thatak a nei a ni.	SD	D	N	A	SA

D. Risk Identification (5)

S.no	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Risk in thlak danglam chu bank staff ten kanhre vat thin.	SD	D	N	A	SA
2	Kan bank hian bank dangte risk management system chaknalehchaklohna a hrechianghle.	SD	D	N	A	SA
3	Kan Bank ah hianeng risk hi ngehlauhawmberhriatthiam a harsa.	SD	D	N	A	SA
4	Bank hiana objective in a ken tel risk hranghrangte chu kimchangtakehmumal taka hriatchhuahna a kalpui thin.	SD	D	N	A	SA
5	Ka bank hian investmentti theihna tur ruahmannafelai taka hriattheihna tur kalphung a siam a, a hmangbawk.	SD	D	N	A	SA

E. Risk Analysis & Monitoring (13)

S.no	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Loan latu te <i>financial statement</i> rintlaklehrintlaklohanenfiahthin.	SD	D	N	A	SA
2	Loan latu te sum leh pai dinhmunkanzirchiangmasathin.	SD	D	N	A	SA
3	Loan latu terintlaklehrintlaklohhmun dang (<i>external source</i>)atangpawhinkanzirchian gthin.	SD	D	N	A	SA
4	Bank in staff-te min thununna hi kanfimkhurphahhle ani.	SD	D	N	A	SA
5	Bank in loan chungchanga in kaihhruaina hi uluk takin a zirchiangfothin	SD	D	N	A	SA
6	Risk hmachhawn dan tur felfaitakkannei ani.	SD	D	N	A	SA
7	Bank hian loan la tu ten an rulhletheihna tur borrowers <i>tesource of income</i> a hriatpuivekthin.	SD	D	N	A	SA
8	Bank hian Loan pekchhuaheihzatmumaltak a bituk(sanction limit) kannei.	SD	D	N	A	SA
9	Market dinhmun a zirinheng sanction limit tehi siam ani.	SD	D	N	A	SA
10	Market dinhmun a zirinheng	SD	D	N	A	SA

	sanction limit-te hi bank in a ennawnfothin.					
11	Credit policy chu uluk taka hriattirthinkanni.	SD	D	N	A	SA
12	Bank-tehian credit evaluation leh approval atan manual mumaltaknei.	SD	D	N	A	SA
13	Manual te hi thataklehdik takin Bank in kan follow a, a thatawkemtihkan review fothin.	SD	D	N	A	SA

F. Risk Management Practices (13)

S.no	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Kan nitin transactions-te hi a himtawkemtihzirchian hi kannitinhnapakhat a ni.	SD	D	N	A	SA
2	Kan hnathawhte a lo felfailehzual nan staff rotation a khat mawitawkinanneithin.	SD	D	N	A	SA
3	Branch min audit thintu hi pawn lam mi, kan control theihloh an ni.	SD	D	N	A	SA
4	Bank-in policy a siamdawnin, bank performance nghawngthei tur bank pawn leh bank chhung lam a thilthlengtawhlethlengtheiteuluk	SD	D	N	A	SA

	taka chhutthin a ni.					
5	Mipuiten an duh hunah an duh ang zatpawisa an withdraw theihnan; Bank a pawisakawlzat tur mumal taka bituk a ni.	SD	D	N	A	SA
6	Kan bank chuanRisk Management Department (RMD)hrankannei.	SD	D	N	A	SA
7	Kan bank chuan tun hma a loan rulthatheiloterulhtheihlohchhanzir Chiang in, tun a loan diltutethlitfim nan kanhmang ani.	SD	D	N	A	SA
8	Credit Risk hi a hlawmdeuhhleak a control tum thin ani.	SD	D	N	A	SA
9	Kan loan-te a lo him lehzual nan, kan bank hiankalphungmumaltakleh in kaihhruainamumaltakkannei ani.	SD	D	N	A	SA
10	Bank hian <i>bank risk</i> hranghrangtezirchiangturingcommi ttee hrang a din a ni.	SD	D	N	A	SA
11	Loan pek tur kanthlitfim dan review kawngahlehchumichungchang a Staff-te feedback ngaihthlakkawng ah kan Bank hianhnaṯha takin a ṯhawk ani.	SD	D	N	A	SA
12	Reports system leh risk management guidelines kanhmantezirchian hi internal	SD	D	N	A	SA

	auditor temawhphurhna ani.					
13	Operational risk hranghrang-fraud, employee error, cyber security etclak a kan him theih nan bank hiannasa takin training min pe a ni.	SD	D	N	A	SA

G.Perceptions of bank officers of credit risk management practices (13)

S.no	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Credit risk laka Bank a him nan, inkhaihruaina (policy) thatakkannei ani.	SD	D	N	A	SA
2	Loan puktutezircchian (assessment) mumallohna hian Loan chhia (NPA) a siambelh ani.	SD	D	N	A	SA
3	Loan lakrawndiltute hi Bank inkaihhruaina ang thlap a lo zircchian (assess) thin an ni.	SD	D	N	A	SA
4	Loan kan sanction hma in, kan client-temizia, loan rulh an tum dan leh an hmantumna a diktawkemti huluk takin kanzircchianghmasathin.	SD	D	N	A	SA
5	Bank Policy ang zelin Loan pe chhuakthei (authority) ten loan an approve thin.	SD	D	N	A	SA
6	Bank hianmimale maw, pawl-te Loan kanpekchhuahtheih zat bitukmum altak a nei ani.	SD	D	N	A	SA
7	Collateral (dahkham), insurance leh guarantor hmanginkan loan-tekan safeguard thin.	SD	D	N	A	SA
8	Loan kan renew dawn in kan customer-te portfolio uluk takin, bank kalphunganginkan zirnawn leh thin.	SD	D	N	A	SA

9	Credit risk lak a kan him theih nan Bank in hmunhranghrang ah investment a siamthin.	SD	D	N	A	SA
10	NPAs-te a rang thei ang berakanhriattheihnaturin bank in internal control felfaitakkannei.	SD	D	N	A	SA
11	Bank hian Loan Monitor-nahmanruathataktak viz., Financials due diligence, Stock Inspection, MSOD (Monthly Statement of Operational Data), QPRs (Quarterly Prudential Return), Early Warning Signals etc. kannei a, a tulhunahkanhmangtangkhahle.	SD	D	N	A	SA
12	Bank in a recovery hmanrua a neih viz., Credit guarantee scheme, SARFAESIA, IBC / DRT / DRAT/ CIVIL Suit / RC etc. te hi a hun ah tangkai taka hman ani	SD	D	N	A	SA
13	A hun taka Credit Agency hranghrang a report kanthehluhhian, loan puktu ten loan rulh an ngaihpawimawhphah a ni.	SD	D	N	A	SA

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ABSTRACT

**RISK MANAGEMENT PRACTICES WITH REFERENCE TO
CREDIT RISK MANAGEMENT AMONG THE SELECTED
BANKS IN MIZORAM**

**AN ABSTRACT SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY**

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**DEPARTMENT OF COMMERCE
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JUNE,2025**

RISK MANAGEMENT PRACTICES WITH REFERENCE TO CREDIT RISK
MANAGEMENT AMONG THE SELECTED BANKS IN MIZORAM

BY

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Submitted

In partial fulfilment of the requirement of the Degree of Doctor of Philosophy in
Commerce of Mizoram University, Aizawl

Summary of Chapters

The present study has been structured and presented in the form of the following five chapters:

- Chapter 1 Introduction
- Chapter 2 Literature Review
- Chapter 3 Research Methodology
- Chapter 4 Risk Management Practices among Banks in Mizoram
- Chapter 5 Summary of Findings and Suggestions

The chapters in the study are summarized as follows:

Chapter 1 : Introduction

Risk Management Process

The International Organization for Standardization (ISO) has developed comprehensive guidelines for risk management through its widely recognized standard, ISO 31000. While risk management as a concept has evolved over time through contributions from various fields (e.g., finance, engineering, and project management), ISO 31000, first published in 2009 and revised in 2018, formalized and popularized this structured process on a global scale. It provides a standardized, widely applicable framework that organizations, including banks, use to systematically manage risks. ISO 31000:2018 outlines the risk management process in a clear, iterative sequence that includes the following key stages: risk identification, risk analysis, risk assessment and risk mitigation (risk treatment).

Credit Risk

Credit risk is a major concern for banks, stemming from the chance that borrowers won't repay loans, like mortgages or business financing. Defaults, especially during economic slumps, can hit a bank's finances hard, with rising NPAs straining balance sheets. Banks manage this by thoroughly checking borrowers' creditworthiness, setting lending caps, spreading loans across different sectors, and setting aside funds for potential losses. Basel II and III stress holding enough capital to cover defaults, keeping banks solvent. In India, where public sector banks often lend to riskier sectors, credit risk remains a top priority.

Challenges of Mizoram's Banking sector

India's banking sector has been transformed by rapid digitalization, driven by programs like Digital India and the Unified Payments Interface (UPI), making financial services faster and more accessible. But this shift has also brought a surge in cybersecurity risks. In 2024, India faced a staggering 79 million cyberattacks, with banks being prime targets due to their troves of sensitive customer data and critical systems. Mizoram, a northeastern state with 1.2 million people and a banking sector focused on lending to priority areas like agriculture and small businesses, faces its own set of challenges. Limited internet access, low awareness of digital security, and its location near Myanmar and Bangladesh make it particularly vulnerable. Global events, like the 2021 Myanmar military coup and the ongoing Rohingya refugee crisis in Bangladesh, have worsened these risks, fuelling regional instability, cross-border cyberattacks, and economic pressures.

Chapter 2 : Literature Review

Al-Tamimi (2002) analyzes risk management in UAE commercial banks. Banks focus on credit, liquidity, and operational risks, but less on market risks, influenced by size and regulations. The study suggests stronger frameworks and controls to boost financial stability.

Isomiddinovich et al. (2024) propose a risk management framework for commercial banks. Strong controls, monitoring, and training manage credit and liquidity risks, guiding banks to ensure stability.

Costello and Minnis (2024) study liquidity risk in digital banking. Real-time monitoring manages fast transactions, but needs new frameworks, helping banks adapt to digital-era risks.

Identification of research gap and point of entry for the thesis.

The banking sector in Mizoram operates in a market dominated by the priority sector. Despite the extensive body of research on risk management practices in banking, a notable gap exists in the literature concerning the distinctive socio-economic and operational context of Mizoram's banking sector. The state's unique challenges—such as a restrictive business environment, limited market diversity and inadequate infrastructure—coupled with its low Credit-Deposit Ratio and a banking

sector dominated by public sector undertakings like SBI, MRB, and MCAB, require a separate investigation. Studies like Ahmad and Ariff (2008) have underscored the importance of region-specific risk management strategies, yet the focus in the literature studies remains predominantly on urbanized or larger banking markets, overlooking smaller, regional contexts like Mizoram. To date, only Zonuntluanga (2014) have explored this area, focusing mainly on borrowers' perceptions of NPA management, leaving broader risk management practices underexplored. In light of this scarcity of research, the present study aims to bridge this gap by exploring the risk management practices among banks in Mizoram from the perspective of risk managers. The Government of Mizoram's Handholding policy, with its collateral-free loan scheme, further underscores the urgency of understanding these practices, offering a timely point of entry to assess how banks manage risks in this evolving regional landscape.

Chapter 3 : Research Methodology

Research Objective

Effective risk management is crucial in banking, as it mitigates potential losses and enhances profitability. This study investigates the determinants of credit risk and its impact on profitability, while also assessing bank officers' risk management practices in general and credit risk management practices in selected banks in Mizoram. The study's specific objectives are as follows:

1. To study the determinants of credit risk in Mizoram.
2. To determine the extent to which credit risk affects profitability among banks in Mizoram.
3. To study the risk management practices of banks in Mizoram
4. To study the perceptions of bank officers toward risk management practices.
5. To study the perceptions of bank officers relating to credit risk management practices of credit appraisal process, risk mitigation tools and credit control and recovery.

Research Design

The study adopts a quantitative research design method to fulfill its multifaceted objectives. The data were gathered from both primary and secondary

sources. Secondary data were collected for selected parameters for a period of 9 years from 2012-13 to 2020-21.

Primary data were collected via a structured questionnaire to assess bank officers' perceptions and practices related to risk management. This dual approach integrates quantitative depth with qualitative insights, enabling a holistic examination of risk management within Mizoram's banking sector.

Sample Design

Universe

A sample is a subset of larger population or universe for study or analysis. To determine the universe for the study, the researchers conducted a preliminary study on banking activity in Mizoram and conducted personal interviews with bank officers from the Regional Head office of SBI, Head Office of the Mizoram Rural Bank and the Main Office of the Mizoram Co-operative Apex Bank. The result of the preliminary study has shown that, as of 1st April, 2022 there were 220 bank branches that are operating in Mizoram; out of which 46 branches are operated by State Bank of India, 97 branches by Mizoram Regional Rural Bank and 23 branches by Mizoram Co-operative Apex Bank. Therefore, it has been decided that the study will be confined to these three banks which together operate 75% of all the bank branches in Mizoram.

State Bank of India (SBI) established its first branch in Mizoram in 1972. Mizoram Cooperative Apex Bank (MCAB), established in 1982, was followed by Mizoram Rural Bank (MRB) in 1983. The three selected banks - State Bank of India, Mizoram Rural Bank, and Mizoram Cooperative Apex Bank - are the pioneering institutions in Mizoram's banking sector, maintaining a dominant market share.

Secondary Data

Secondary data are collected from the annual report of respective banks, slbc website (slbcne.nic.in) and reports retrieve from the directorate of statistics, Govt. of Mizoram. Our sample consists of balanced panel of three public sector banks-the State Bank of India (SBI), the Mizoram Rural Bank (MRB) and the Mizoram Cooperative Apex Bank (MCAB). The period of analysis consists of 9 years from 2012-13 to 2020-21.

Variables:

Based on the readings of previous related studies, these variables were selected based on their relevance to Mizoram's banking sector and alignment with theoretical frameworks on risk management.

Table 3.2: The Proposed Theoretical work

Proxy	Name of Variable	Author and Year
Credit Risk	Non-Performing Assets (NPAs)	Yusditasari et al., 2023; Fombang& Maseko, 2024.
	Capital Adequacy Ratio(CAR)	De Leon, 2020; Mendoza & Rivera, 2017; Muhamet & Arbana, 2016; Ngurah & Panji, 2021.
	Credit Deposit Ratio (CD Ratio)	Gupta & Sikarwar, 2020; Fauziah & Fadhilah, 2022; Muhammed et al., 2023.
Determinants of Credit risks	Capital Adequacy Ratio (CAR)	Nugrahaeni&Muharam, 2023; Bhatt et al., 2023; Shaheen et al., 2024; Ayele, 2024.
	Credit Growth	Bhatt et al., 2023; Nugrahaeni&Muharam, 2023; Ayele, 2024; Shaheen et al., 2024.
	Credit Deposit ratio	Bhatt et al. 2023; Nugrahaeni&Muharam,2023; Ayele, 2024; Shaheen et al. 2024.
	Inflation	Bhatt et al., 2023; Nugrahaeni&Muharam, 2023; Ayele, 2024; Shaheen et al., 2024.
	Economic Growth	Bhatt et al., 2023; Nugrahaeni&Muharam, 2023; Ayele, 2024; Shaheen et al., 2024.
Profitability	ROA	Muhammed et al., 2023; Yusditasari et al., 2023; Fombang& Maseko, 2024.

	ROE	Fauziah & Fadhilah, 2022; Yusditasari et al., 2023; Fombang& Maseko, 2024
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Source: Researchers' Compilation

Primary Data

Questionnaire design:

A questionnaire developed by Al-Tamimi and Al-Mazrooei (2007) was modified and translated into the local language i.e., Mizo and was used to collect the data for this study. The questionnaire has also been adopted fully or partially by authors such as Wang and Rasheed (2011), Abu Hussain and Al-Ajmi (2012), Raza Bilal et.al (2013) and Khan et.al (2020). The questionnaire is divided into two parts:

Part A solicits information about the respondents and the bank for which they work;

Part B of the study focuses on seven key aspects of risk management in banking, assessed through 69 closed-ended questions using a five-point Likert scale. The breakdown of questions by aspect is as follows:

- Understanding Risk and Risk Management (URRM): 7 questions
- Availability of Resources for Risk Management (ARRM): 10 questions
- Perceptions of Bankers Towards Risk Management (PBRM): 8 questions
- Risk Identification (RI): 5 questions
- Risk Analysis and Monitoring (RAM): 13 questions
- Risk Management Practices (RMP): 13 questions
- Credit Risk Management Practices (CRM): 13 questions

Respondents rated their agreement with each statement on a five-point Likert scale, typically ranging from "Strongly Disagree" to "Strongly Agree." This structure allows for quantitative analysis of attitudes and perceptions across the specified risk management dimensions.

Sampling and Data Collection:The population for this study is risk management committee members, branch managers, line managers who are accountable for risks under their control, and core staff of Head offices who are involved in risk management and are engaged with banks in Mizoram. According to the financial statement from March 2022, the three selected banks reported the

following number of officers: State Bank of India (SBI) with 137 officers, Mizoram Rural Bank (MRB) with 241 officers, and Mizoram Co-operative Apex Bank (MCAB) with 55 officers. A total of 167 questionnaires were returned, out of the 200 questionnaires circulated to various banks branches. 11 questionnaires were not appropriately filled and were later excluded. A sample size of 156 bank officers was chosen, consistent with methodologies used in prior similar studies, such as Arora(2011) and Bhardwaj(2018). Data were collected from 82 bank branches spanning all eleven districts of Mizoram.

Validity and Reliability

Secondary Data

The data used for the analysis were tested for normality using Kolmogorov-Smirnov test and Shapiro-Wilk test; corrections were made using inverse distribution and log transformation if necessary.

To ensure unbiased regression results, collinearity diagnostics were conducted using tolerance and Variance Inflation Factor (VIF) tests, as reported in Table 3.3. Model 1 assessed multicollinearity across all three banks (SBI, MRB, MCAB), while Model 2 focused on MRB and MCAB due to SBI's national operations lacking Mizoram-specific profit/loss data. All explanatory variables exhibited VIF values below 10 and tolerance above 0.1, indicating no significant multicollinearity issues (Gujarati and Porter, 2009).

Primary Data

Cronbach's alpha, which measures respondents' consistency in responding to scale questions was used to evaluate the reliability of the scale. This measure consists of estimates of how much variation in scores of different variables is attributable to chance or random errors (Selltiz et al., 1976). As a general rule, a coefficient greater than or equal to 0.7 is considered acceptable and a good indication of construct reliability (Nunnally, 1978). The overall Cronbach's alpha for the seven aspects is (.954). The Cronbach's alpha for the individual aspect is – Understanding Risk and Risk Management (.847), Availability of Resources for Risk Management (.882), Perception of Bankers towards Risk Management (.844), Risk Identification (.743),

Risk Analysis and Monitoring (.890), Risk Management Practices (.833) and Credit Risk Analysis (.871). The result shows that all the aspects are reliable.

Data analysis techniques

Objective 1: To study the determinants of Credit Risk in Mizoram.

Owing to the panel nature of the dataset, which includes both cross-sectional and time series dimensions, we use the Fixed Effect Least-Squares Dummy Variable (LSDV) model as discussed by Gujarati and Porter (2009) for our econometric analysis. Employing a panel regression approach can help estimate unobserved entity-specific and time-specific effects that are difficult to get using a pure time-series or cross-sectional regression. LSDV uses dummy variables which allow each cross-section unit to have its own intercept. This is demonstrated by Equation (1)

$$NPA_{it} = \alpha_1 + \alpha_2 D_{2i} + \alpha_3 D_{3i} + \beta_4 CRAR_{it} + \beta_5 CG_{it} + \beta_6 CDR_{it} + \beta_7 GSDP_{it} + \beta_8 INF_{it} + u_{it} \quad (1)$$

where i is the i^{th} subject and t is the time period for the aforementioned variables.

$D_{2i} = 1$ for Bank 2, 0 otherwise; $D_{3i} = 1$ for Bank 3, 0 otherwise; we have three categories; we have introduced only two dummy variables to avoid falling into the dummy-variable trap. The intercept α_1 is the intercept value of Bank 1 and the other α coefficients represent by how much the intercept values of the other banks differ from the intercept value of the first bank. Thus, α_2 tells by how much the intercept value of the second bank differs from α_1 . The sum $(\alpha_1 + \alpha_2)$ gives the actual value of the intercept for bank 2. Hypotheses H_1 to H_5 are framed to test the determinants of credit risks among banks in Mizoram.

Objective 2: To determine the extent to which credit risk affects profitability among banks in Mizoram.

To investigate the relationship between credit risk and bank profitability, a quantitative research design was chosen. The study employed a cross-sectional design, focusing on studied banks operating in Mizoram. As SBI does not prepare final accounts based on its operations within Mizoram, their ROA and ROE calculated from within Mizoram were not available. Hence, only two banks

MRB and MCAB were included in the analysis for this objective. However, running a panel data with only two groups can restrict the ability of panel model like Generalized Least Square (GLS) to reliably estimate group-specific effects. So, in a very few groups, GLS may fail to detect heterogeneity. Running both Ordinary Least Square (OLS) and Generalized Least Square (GLS) together confirms efficiency by comparing their results. Employing multiple models to ensure the robustness of a panel model is also done by author like Noman et. al (2015). Thus, we are employing both models to ensure robustness and verify whether panel effects justify GLS over OLS.

The impact of credit risk on profitability of the studied banks in Mizoram will be analyzed using the following basic panel linear regression model:

$$Y_{it} = c + \sum \beta_i X_{it} + \varepsilon_{it} \dots \dots \dots (2)$$

where i indicate the i^{th} bank and t indicates time period. The dependent variable Y is the profitability of the banks. The explanatory variables are indicated by X in the regression equation. In addition, c is constant and β is the coefficient of the regressors. Finally ε is the error term or disturbances. Hypotheses H_6 to H_{11} are framed to test the relationship between banks' profitability and credit risks among banks in Mizoram.

Objective 3: To assess the risk management practices of banks in Mizoram

Spearman's rank correlation was employed to analyze the relationships between RMPs and the six factors (URRM, ARRM, PBRM, RI, RAM, and CRM). This non-parametric method is suitable for ordinal data and measures the strength and direction of monotonic relationships. Hypotheses H_{12} to H_{17} are framed to assess the risk management practices of banks in Mizoram.

Objective 4: To study the perception of bank officers towards risk management practices

Objective 5: To study the perceptions of bank officers relating to credit risk management practices of credit appraisal process, risk mitigation tools and credit control and recovery.

Non-parametric statistical tests were employed due to the ordinal nature of the Likert-scale data. Hypotheses H_{18} to H_{23} are framed to test the perception of bankers towards risk management practices and credit risk management. For hypotheses H_{18} and H_{21} (variation across selected banks) and H_{21} and H_{23} (variation across work experience), the Kruskal-Wallis H test was used, suitable for comparing more than two independent groups. For hypotheses H_{19} and H_{22} (gender differences), the Mann-Whitney U test was applied, appropriate for comparing two independent groups. Data were collected from 156 bank officers across SBI, MRB, and MCAB, ensuring sufficient sample size for robust analysis.

Chapter 4 : Risk Management Practices Among Banks in Mizoram

Analysis of the determinant of credit risk in Mizoram

We employed the Fixed Effects Least-Squares Dummy Variable (LSDV) model to estimate the regression coefficients, thereby accounting for individual-specific heterogeneity and time-invariant effects. This approach enabled us to control for unobserved factors that may influence the dependent variable.

The results of a Fixed Effect Least-Squares Dummy Variable (LSDV) model examining the impact of Capital to Risk-Weighted Assets Ratio (CRAR), Credit Growth (IDF_CG), Credit-Deposit Ratio (IDF_CDR), Inflation (IDF_INF), and Gross State Domestic Product (IDF_GSDP) on NPA, with two dummy variables (Dummy_1 and Dummy_2) controlling for fixed effects. The model uses unstandardized and standardized coefficients, t-statistics, and p-values to assess the significance of each predictor.

H_1 : *There is a negative relationship between Capital Adequacy Ratio (CRAR) and Non-Performing Assets (NPA).*

The analysis supports hypothesis H_1 , showing a statistically significant negative relationship between Capital to Risk-Weighted Assets Ratio (CRAR) and NPA with a coefficient of -0.784 (standardized beta = -0.709, $p=0.000$). The strong negative effect ($t=-8.346$) indicates that higher CRAR, reflecting greater capital adequacy, is associated with lower NPA levels, aligning with expectations that robust capital buffers enhance risk management and reduce loan defaults (Saunders & Cornett, 2017).

H₂ : There is a positive relationship between Credit Growth (CG) and Non-Performing Assets (NPA).

The analysis does not support hypothesis H₂, which posited that stronger Credit Growth (CG, measured by IDF_CG) is associated with higher NPA. The coefficient for IDF_CG is 0.158 (standardized beta = 0.138, p=0.126), indicating a weak positive relationship, but the p-value exceeds the 0.05 threshold, showing no statistical significance. The t-statistic (1.608) and small effect size suggest credit growth has minimal impact on NPA in Mizoram's banking sector.

H₃ : There is a positive relationship between Credit Deposit Ratio (CDR) and Non-Performing Assets (NPA).

The analysis supports hypothesis H₃, showing a statistically significant positive relationship between Credit-Deposit Ratio (CDR, measured by IDF_CDR) and NPA with a coefficient of 0.509 (standardized beta = 0.459, p=0.036). The moderate effect size and significant t-statistic (2.274) indicate that higher CDR, reflecting aggressive lending, increases NPA levels, consistent with Mishra and Prakash (2018). This confirms that elevated CDR are associated with higher default risks in Mizoram's banking sector.

H₄ : There is a negative relationship between Economic Growth (GDP) and Non-Performing Assets (NPA).

The analysis supports hypothesis H₄, showing a statistically significant negative relationship between Gross State Domestic Product (GSDP, measured by IDF_GSDP) and NPA with a coefficient of -2.366 (standardized beta = -0.365, p=0.005). The moderate negative effect and significant t-statistic (-3.230) indicate that higher GSDP, reflecting economic growth, reduces NPA by improving borrowers' repayment capacity, consistent with Saunders and Cornett (2017). This confirms that stronger economic conditions lower NPA levels in Mizoram's banking sector.

H₅ : There is a positive relationship between Inflation (INF) and Non-Performing Assets (NPA).

The analysis does not support hypothesis H₅, which posited that higher Inflation (INF, measured by IDF_INF) increases NPA. Instead, a significant negative relationship is found with a coefficient of -2.800 (standardized beta = -0.533,

$p=0.000$), indicating that higher inflation is associated with lower NPA, contradicting the expected positive relationship. The strong effect and t-statistic (-4.541) suggest banks' adaptive lending practices or borrower resilience in Mizoram's context, though multicollinearity or model issues may contribute (Mishra & Prakash, 2018). Thus, H_5 is not supported, as inflation does not increase NPA levels.

Analysis of data to study the effect of credit risk on profitability

The Hausman test is used to compare random effects GLS with fixed effects in panel data models. As determined by the Hausman test, with p-values of 0.5688 for ROA and 0.9956 for ROE, both exceeded 0.05, supporting the null hypothesis. Therefore, GLS random effect was chosen. Table 4.13 presents OLS and GLS outputs, demonstrating the impact of credit risk on bank profitability, with GLS employed for robustness.:

The results of OLS and GLS-random effect models assessing the impact of credit risk variables—CDR, Log_CRAR, and Log_NPA—on bank profitability, measured as ROA and ROE. The analysis is based on a panel of 18 observations, with the Wald chi-square test indicating a good model fit for ROA ($\chi^2 = 13.83$, $p = 0.0031$ in GLS but poor fit for ROE ($\chi^2 = 1.94$, $p = 0.5853$), suggesting limited explanatory power for ROE. This is confirmed by the low R-square for ROE, indicating that only 10.8 percent is explained by the independent variable.

H_6 : There is a negative relationship between Return on Assets (ROA) and Non-Performing Assets (NPA).

The OLS and GLS models show a negative Log_NPA coefficient (-0.0206, $p=0.599$ in OLS; -0.0206, $p=0.591$ in GLS), aligning with the expected direction, but the p-values indicate no statistical significance. The analysis does not support hypothesis H_6 , which proposed that higher NPA are associated with lower ROA. NPAs have negligible impact on ROA among banks in Mizoram. Thus, H_6 is rejected.

H_7 : There is a negative relationship between Return on Equity (ROE) and Non-Performing Assets (NPA).

The analysis does not support hypothesis H₇, which predicted that higher NPA are associated with lower ROE. Again, the OLS and GLS model indicate a negative coefficient between ROE and ROA (-0.0561). This suggested that as NPA increases, ROE decreases. However, the negative relationship between NPA and ROE is not significant as the p-value is more than 0.05 (0.967 > 0). Thus, H₇ is rejected.

H₈ : There is a negative relationship between Return on Assets (ROA) and Capital Adequacy Ratio (CRAR).

The literatures have indicated a positive relationship between ROA and CRAR, therefore our hypothesis has predicted a positive relationship between the two variables. As expected, our analysis using OLS and GLS have indicated a positive relationship. The coefficient between ROA and CRAR in both the model is 1.3218, but the relationship is not statistically significant as the p-value is greater than threshold of 0.05 (0.096 and 0.077 > 0). Thus, H₈ is rejected.

H₉ : There is a negative relationship between Return on Equity (ROE) and Capital Adequacy Ratio (CRAR).

Similarly, existing literatures have predicted a positive relationship between ROE and CRAR. The OLS and GLS model shown a positive coefficient (6.6984) in both the model, however, the relationship is not statistically significant (0.803 > 0). Thus, H₉ is rejected.

H₁₀ : There is a negative relationship between Return on Assets (ROA) and Credit Deposit Ratio (CDR).

CDR is the amount of credit disbursed by the banks for every deposit they received. Thus, higher CDR indicate higher credit risk. It can be expected that higher CDR would increase profit if credit risk is efficiently managed. The existing literatures have suggested a mixed findings in the relationship with CDR and ROA. As the study is conducted in an area dominated by the priority sector, which are often linked to increase NPA. We expect a negative relationship between CDR and ROA. However, our analyse have indicated a positive but statistically insignificant coefficient of 0.0127. Thus, H₁₀ is rejected.

H₁₁ : There is a negative relationship between Return on Equity (ROE) and Credit Deposit Ratio (CDR).

Similarly, the relationship between ROE and CDR is expected to be negative. The OLS and GLS output have indicated a positive but insignificant relationship between ROE and CDR with the coefficient value of 0.3248 and a p-value of 0.374 and 0.361. Thus, H_{11} is rejected.

Types of risk

Commercial banks in Mizoram face significant risks, with credit risk being the most prominent, particularly for MCAB and MRB, as confirmed by bank officers and aligned with Hameeda and Al-Ajmi (2012). Operational risks, including network issues and competition, are also notable, though SBI officers highlight greater exposure to market and operational risks, likely due to a strategy of mitigating credit risk by investing deposits in securities, reflected in its lower credit deposit ratio of 38.69 in 2021-22 compared to MCAB (70.64) and MRB (59.30). The varying risk profiles across banks underscore the influence of regional business environments and risk management strategies.

Results

The Spearman's correlation results, summarized in Table 4.23, indicate varying levels of support for the hypotheses. The findings are organized by hypothesis for clarity, with correlation coefficients, significance levels, and interpretations provided.

Table 4.23: Spearman Correlations

		RM P	URR M	ARR M	PBR M	RI	RA M	CRM
RM P	Correlation Coefficient	1.000	.061	.252**	.589**	.109	.450*	.508*
	Sig. (2-tailed)	.	.452	.002	.000	.176	.000	.000
	N	156	156	156	156	156	156	156

**p < 0.01, *p < 0.05 (2-tailed)

Source: *Researchers' Compilation*

H₁₂ : A higher level of understanding of risks and risk management (URRM) among bank officers is positively associated with the adoption and effectiveness of risk management practices (RMP) in banks.

The correlation between URRM and RMP was weak and statistically insignificant ($\rho = 0.061$, $p = 0.452$). This suggests no meaningful monotonic relationship between bank officers' understanding of risks and the adoption or effectiveness of risk management practices. Contrary to prior studies (e.g., Acharya & Richardson, 2010), H_{12} is not supported. This suggested that a higher level of understanding of risks and risk management among bank officers is positively associated with the adoption and effectiveness of risk management practices in banks, however indicating that a higher understanding of risks among bank officers does not significantly enhance risk management practices among the studied banks in Mizoram.

H₁₃ : Greater availability of resources for risk management (ARRM) in banks is positively associated with the adoption and effectiveness of risk management practices (RMP) in banks.

A weak but statistically significant positive correlation was found between ARRM and RMP ($\rho = 0.252$, $p = 0.002$). This indicates that greater resource availability is associated with improved adoption and effectiveness of risk management practices, though the relationship is weak (Myers & Well, 2003). This finding aligns with Costello and Minnis (2024) and supports H_{13} . The weak but statistically positive correlation could imply resource levels vary within a constrained range, potentially capping ARRM's impact towards RMP.

H₁₄ : Positive perception of bankers towards credit risk management practices (PBRM) is positively associated with the adoption and effectiveness of overall risk management practices (RPM).

A moderately strong and highly significant positive correlation was observed between PBRM and RMP ($\rho = 0.589$, $p < 0.01$). This suggests that positive perceptions among bankers significantly enhance the quality and implementation of risk management practices. H_{14} is supported, consistent with the literature emphasizing the role of perception in risk management outcomes. This suggests that as officers' perceptions improve, so do the quality or implementation of risk

management practices, with a notable effect size. This supports the hypothesis H₁₄ that ‘positive perception of bankers towards risk management practices is positively associated with the adoption and effectiveness of overall risk management practices.’

H₁₅ : Effective risk identification (RI) is positively associated with the implementation and success of risk management practices (RMP).

The correlation between RI and RMP is positive with coefficient of 0.109, but very weak (Myers & Well, 2003) and statistically insignificant at $p = 0.176$ (not significant at $p < 0.05$ or $p < 0.01$). This indicated no meaningful monotonic relationship between effective RI and the implementation/success of RMP. This very weak, insignificant relationship contrasts with literature (e.g., Allen & Saunders, 2012; Acharya & Richardson, 2010). Thus, the hypothesis H₁₅ which states that ‘effective risk identification is positively associated with the implementation and success of risk management practices’ is not supported by our sample.

H₁₆ : Robust risk analysis and monitoring (RAM) are positively associated with the implementation and effectiveness of risk management practices (RMP)

The Spearman’s correlation of 0.450 is positive, moderately strong, and highly significant ($p < 0.01$, significant at the 0.01 level, 2-tailed), indicating a robust monotonic relationship between risk analysis and monitoring (RAM) and the implementation/effectiveness of risk management practices (RMP). This suggests that as officers’ capabilities in risk analysis and monitoring improve, so does the quality and success of risk management practices, with a substantial effect size. This moderately strong relationship (Myers & Well, 2003) aligns with the literature (e.g., Jorion, 2007; Costello & Minnis, 2024) that risk analysis and monitoring underpins the successful risk management practices. Thus, the hypothesis H₁₆ which states that ‘robust risk analysis and monitoring are positively associated with the implementation and effectiveness of risk management practices’ is supported.

H₁₇ : Robust Credit Risk Management (CRM) are positively associated with the implementation and effectiveness of risk management practices (RMP).

The correlation between CRM and RMP is positive with a correlation coefficient of 0.508, moderately strong, and highly significant ($p < 0.01$, significant at the 0.01 level, 2-tailed), indicating a robust monotonic relationship between bankers’ positive perceptions of credit risk management (CRM) and the

adoption/effectiveness of overall risk management practices (RMP). This suggests that as officers' perceptions of credit risk practices improve, so does the quality and implementation of broader risk management, with a substantial effect size. This moderately strong relationship (Myers & Well, 2003) aligns with findings (e.g., Chu & Ng, 2023; Altman & Saunders, 1997) that trust in credit tools drives broader risk outcomes. The hypothesis H_{17} which state that 'positive perception of bankers towards credit risk management practices is positively associated with the adoption and effectiveness of overall risk management practices' is supported.

Analysis of Bankers' Perceptions towards Risk Management Practices (RMP) and Credit Risk Management Practices (CRM)

Despite sharing a common regulatory framework, the studied banks differ in resources, scale, and operational focus, which may influence how bank officers perceive RMP and CRM. RMP encompasses strategies for mitigating operational, liquidity, and compliance risks, while CRM focuses on credit-specific controls, such as loan appraisal and recovery, critical to banking performance (Saunders & Cornett, 2017). Demographic factors, including gender and work experience, may further shape these perceptions, reflecting individual and institutional priorities (Mishra & Prakash, 2018).

This section tests six hypotheses to examine whether perceptions of RMP and CRM vary across selected banks, gender, and work experience among bank officers in Mizoram. Non-parametric statistical tests, suitable for ordinal data, were employed to analyze these relationships. The results provide insights into the factors influencing risk management perceptions and their implications for banking resilience.

H_{18} : *The perception of risk management practices (RMP) varies significantly among bank officers across different selected banks.*

The Kruskal-Wallis H test yielded a significant result ($\chi^2 = 6.205$, $df = 2$, $p = 0.045$), indicating that perceptions of RMP vary significantly across the three banks. Our analysis have shown that SBI officers had the highest mean rank (87.09), followed by MCAB (77.39) and MRB (71.98), suggesting SBI officers perceive RMP most positively. H_{18} is supported.

H₂₁ : The perception of credit risk management practices (CRM) varies significantly among bank officers across different selected banks.

The test was not significant ($\chi^2 = 1.524$, $df = 2$, $p = 0.467$), indicating no significant variation in CRM perceptions across banks. Although SBI officers had the highest mean rank (83.76), followed by MCAB (76.70) and MRB (75.21), the differences were not statistically significant. H_{21} is not supported.

H₁₉ : Male bank officers perceive risk management practices (RMP) more positively than female bank officers.

The Mann-Whitney U test showed no significant difference in RMP perceptions between male and female officers ($U = 2625.000$, $z = -1.855$, $p = 0.064$). Female officers had a higher mean rank (83.96) than male officers (74.17), suggesting females perceive RMP slightly more positively, though not significantly at $p < 0.05$. H_{19} is not supported.

H₂₂ : Male bank officers perceive credit risk management practices (CRM) more positively than female bank officers.

No significant difference was found between male and female officers ($U = 2938.500$, $z = -0.263$, $p = 0.793$). Female officers had a marginally higher mean rank (79.41) than male officers (77.78), but the difference was negligible. H_{22} is not supported.

H₂₀ : Bank officers with greater work experience perceive risk management practices (RMP) more positively than those with less work experience.

The Kruskal-Wallis H test was not significant ($\chi^2 = 2.524$, $df = 4$, $p = 0.640$). Although officers with more than 30 years of experience had the highest mean rank (86.30), followed by 20–30 years (80.39), and those with less than 5 years had the lowest (72.55), the differences were not statistically significant. Therefore, H_{20} is not supported.

H₂₃ : Bank officers with greater work experience perceive credit risk management practices (CRM) more positively than those with less work experience.

The test was also not significant ($\chi^2 = 6.423$, $df = 4$, $p = 0.170$). Officers with more than 30 years of experience had the highest mean rank (91.50), but the 10–20

years group had the lowest (68.72), indicating inconsistent patterns. Again, H_{23} is not supported.

Chapter 5: Findings, Conclusions and Recommendations

Findings

The findings highlight key insights into risk management dynamics and their impact on banking performance in Mizoram.

- In Mizoram's banking sector, Basel III mandates a Capital to Risk-Weighted Assets Ratio (CRAR) of 8%, but the Reserve Bank of India (RBI) sets higher thresholds at 9% for scheduled commercial banks and 12% for public sector banks. In 2021, Mizoram Rural Bank (MRB) recorded a CRAR of 9.48%, below the public sector benchmark, while Mizoram Cooperative Apex Bank (MCAB) achieved a robust 16.13%, reflecting RBI's efforts to enhance stability through recapitalization and stricter provisioning. A significant negative correlation between CRAR and Non-Performing Assets (NPAs) ($r = -0.784$, $p < 0.01$) highlights that higher capital adequacy reduces NPAs, as seen in MCAB's low NPA ratio of 2.18%. Mizoram's Credit-Deposit Ratio (CDR) in 2022 was 45.7%, below the national average of 72.1%, with SBI at a low 33.08%, MRB at 49.66%, and MCAB at 63.43%. A significant positive relationship between CDR and NPAs (Beta=0.509, $p < 0.05$) indicates that higher CDR increases NPAs, reflecting credit risk from deposit-funded lending, though conservative lending keeps banks in a low-risk "safe zone." CDR has an insignificant impact on profitability metrics like Return on Assets (ROA) and Return on Equity (ROE), while Log_CRAR significantly boosts ROA (coefficient=1.6265, $p < 0.05$) but not ROE. Log_NPA shows insignificant effects on both ROA and ROE, suggesting that Mizoram's banks, including MRB, MCAB, and SBI, should prioritize operational efficiency and credit quality over aggressive lending to enhance profitability.
- The study identifies a statistically significant negative relationship between Gross State Domestic Product (GSDP) and Non-Performing Assets (NPAs) in Mizoram's banks at the 1% significance level ($p < 0.01$), with a 1% increase in GSDP associated with a 2.37% decrease in NPAs, indicating that

economic growth reduces loan defaults. Additionally, Mizoram's GSDP has shown robust growth, projected at 11.6% for 2023-24, driven by a shift from agriculture to industry and services sectors, with the service sector contributing 45.7% to Gross State Value Added (GSVA) in 2022-23. Concurrently, a significant negative relationship between inflation (INF) and NPAs (coefficient = -2.800, $p < 0.01$) suggests that a 1% rise in inflation reduces NPAs by 2.8%, contradicting the hypothesis of a positive link, possibly due to local economic dynamics or borrower behavior. These findings highlight that strong GSDP growth and rising inflation together create a favorable environment for reducing NPAs, enhancing credit quality in Mizoram's banking sector, offering actionable insights for policymakers to sustain economic development and manage inflationary pressures effectively.

- Perceived primary risks vary across SBI, MRB, and MCAB, reflecting distinct risk profiles. At SBI ($n=53$), 52.94% cite Credit Risk, 35.29% Operational Risk, and 11.77% Market Risks, indicating diverse concerns. In contrast, all respondents at MRB ($n=41$) and MCAB ($n=29$) exclusively identify Credit Risk (100%), with no mention of Operational or Market Risks. This focus is likely to reflect MRB and MCAB's regional lending emphasis, where credit-related challenges, like NPAs, dominate due to riskier borrower profiles.
- Spearman's correlation analyses among 156 bank officers in Mizoram banks show varied relationships between risk management factors and Risk Management Practices (RMP). Understanding of Risks and Risk Management (URRM) has a weak, insignificant correlation with RMP ($r=0.061$, $p=0.452$), rejecting hypothesis H_{12} and suggesting that institutional policies, not risk comprehension, drive RMP. Availability of Resources for Risk Management (ARRM) exhibits a weak but significant positive correlation with RMP ($r=0.252$, $p=0.002$), supporting H_{13} and indicating that resources like funding and technology moderately enhance RMP, though other factors like organizational priorities also play a role. Perceptions of Bankers towards Risk Management (PBRM) show a moderately strong, highly significant positive correlation with RMP ($r=0.589$, $p<0.01$),

supporting H₁₄ and highlighting that positive banker attitudes significantly boost RMP adoption and effectiveness. Similarly, Credit Risk Management (CRM) has a moderately strong positive correlation with RMP ($r=0.508$, $p<0.01$), supporting H₁₇ and indicating that favorable CRM perceptions improve RMP quality and implementation, aligning with prior studies.

- The Kruskal-Wallis H test reveals significant variation in perceptions of Risk Management Practices (RMP) across bank officers from different Mizoram banks ($\chi^2=6.205$, $p=0.045$), supporting hypothesis H₁₈, with SBI officers showing the highest mean rank (87.09), followed by MCAB (77.39) and MRB (71.98), likely due to SBI's superior resources. However, no significant variation is found for Credit Risk Management (CRM) perceptions ($\chi^2=1.524$, $p=0.467$), rejecting H₂₁, despite SBI's higher mean rank (83.76) compared to MCAB (76.70) and MRB (75.21), possibly due to uniform credit policies. The Mann-Whitney U test indicates no significant gender-based differences in RMP ($p=0.064$) or CRM ($p=0.793$) perceptions, with females having slightly higher mean ranks (83.96 for RMP, 79.41 for CRM) than males (74.17 for RMP, 77.78 for CRM), rejecting H₁₉ and H₂₂, suggesting institutional factors outweigh gender influences. Similarly, no significant differences are found across experience levels for RMP ($p=0.640$) or CRM ($p=0.170$) perceptions, despite officers with over 30 years of experience having the highest mean ranks (86.30 for RMP, 91.50 for CRM), rejecting H₂₀ and H₂₃, indicating that training or institutional culture may drive perceptions more than experience.

Conclusion

This study highlights the critical role of robust capital adequacy (CRAR) and economic growth (GSDP) in reducing NPAs among Mizoram's banks, with higher CDR increasing credit risk. Positive banker perceptions and effective risk analysis significantly enhance risk management practices, though understanding and risk identification show limited impact. Tailored strategies, leveraging regional economic trends and training, are essential for strengthening banking resilience. The findings underscore the need for region-specific policies to address Mizoram's unique banking challenges.

Limitations of the study

- **Geographic Scope:** The study is confined to Mizoram, limiting its generalizability to regions with different economic and banking contexts.
- **Sample Size:** The primary data sample of 156 officers may restrict the statistical power to detect nuanced differences in perceptions, especially across demographic groups.
- **Data Period:** Secondary data (2012–2021) may not fully reflect post-COVID economic shifts or recent regulatory changes, potentially affecting findings' relevance.
- **Self-Reported Data:** Reliance on questionnaires introduces potential response biases, such as social desirability, which may skew officers' perceptions of risk management practices.
- **Quantitative Focus:** The emphasis on quantitative methods may overlook qualitative insights into risk management dynamics, limiting depth of understanding.
- **Bank Selection:** Focusing solely on SBI, MRB, and MCAB excludes private banks, potentially missing diverse risk management strategies

Recommendation

“The banks still have a long way to go for future in order to achieve their objectives. Therefore, the rural people can enjoy the banking facilities more than before.”(Fanai & Singh, 2015). Based on the insights and findings presented, the following recommendations are proposed to address key challenges and optimize outcomes. These suggestions aim to leverage identified opportunities, mitigate potential risks, and provide a clear path forward for effective decision-making and implementation:

Recommendations for Bank Management:

- **Identify an Optimal CRAR Threshold:** The studied bank should conduct internal stress testing and risk assessments to determine a CRAR level that best mitigates NPAs while supporting lending capacity. Banks should aim for a threshold that suits their unique risks exposure and operational climate.

- **Promote Targeted Lending:** Conservative bank like SBI is encourage to cautiously increase lending in underserved sectors (e.g., agriculture or MSMEs in Mizoram), leveraging their position as the bank with the largest resources as a buffer. The bank can expand credit while monitoring the CDR-NPA relationship to stay within the "safe zone."
- **Study Optimal Credit Expansion Limits:** Bank should determine the point at which credit growth begins to meaningfully increase NPAs. This could identify the thresholds where risk incurred from credit increases across loan portfolios outweighs benefits; ensuring growth aligns with the bank's low-NPA strengths.
- **Link Lending Strategies to Economic Trends:** Banks should study how to align credit expansion with GSDP growth, identifying sectors most responsive to economic upturns in their operational region. This could involve analyzing historical loan performance during GSDP fluctuations to optimize portfolio allocation.
- **Investigate CDR's Limited Profitability Impact:** Banks should analyze why even though CDR has a positive effect on ROA (0.0090) and ROE (0.273) but lacks significance. The bank should examine whether factors like high operating costs, low loan yields, or conservative lending weaken its influence.
- **Account for Competitor Operations in Rural Expansion:** When planning expansion into rural areas, bank management should evaluate the presence and operations of existing banks, as respondents citing market competition from other banks were often from branches established later than their competitors. This suggests that earlier-established banks already serve the region, potentially saturating the limited rural population. New branches may face challenges similar to the "Tragedy of the Commons," where finite resources—such as a small customer base—are overstretched, leading to diminished returns.
- **Bridge the gap between RI and RMP:** The lack of a significant relationship between Risk Identification (RI) and Risk Management Practices (RMP), despite a high level of RI, suggests that while bank officers in the field are

proficient at identifying risks, management may not be effectively listening to or acting on their insights. To address this disconnect, management should review and reinforce the processes that connect risk identification to actionable strategies, ensuring that the risks identified by officers directly and effectively inform and shape RMP.

Recommendations for Policymakers:

- **Support Customized CRAR Benchmarks:** While upholding the 9% minimum CRAR for scheduled commercial banks, the RBI should promote the adoption of higher, customized thresholds that account for the distinct risks each bank faces, based on their organizational focus. India's vast and diverse banking sector—spanning rural, cooperative, and commercial entities—cannot be effectively served by a uniform threshold. Instead, the RBI should provide guidelines encouraging banks to simulate CRAR levels based on their exposure to specific risk profiles and NPA scenarios; ensuring capital adequacy aligns with regional and operational realities.
- **Boost Deposit Mobilization:** The government should promote and support initiatives to increase deposit inflows in Mizoram through financial literacy campaigns and rural banking outreach, providing a larger base for lending and reducing reliance on existing deposits, which could ease CDR pressures.
- **Set Region-Specific CDR Guidelines:** Recognizing the region's low CDR (45.7%) compared to the national average (72.1%), the RBI should establish flexible, region-specific CDR targets that account for Mizoram's economic context and conservative lending culture. For instance, a well-calculated target range could encourage growth without triggering systemic risks highlighted by studies like Dhar and Bakshi (2015).
- **Incentivize Balanced Growth:** The RBI should offer incentives tied to priority sector lending, such as reduced statutory liquidity ratio (SLR) requirements or additional benefits. This focus on priority sectors will drive economic activity in underserved areas while encouraging balanced credit growth.

- **Evaluate Economic Interventions for NPA Reduction:** Policymakers should initiatively study to test which GSDP-boosting initiatives such as infrastructure projects, MSME support, etc., most effectively lower NPAs, quantifying their impact to guide resource allocation.

Recommendations for Entrepreneurs:

- **Entrepreneurs should support themselves with quantitative evidence:** With 90.38% of respondents confirming the bank's use of quantitative methods for risk assessment, entrepreneurs should strengthen their credit applications with quantitative proof of creditworthiness—such as detailed business plans, verified cash flow statements, and data demonstrating their capacity to repay loans.
- **Enhance financial documentation:** Enhancing financial documentation is crucial for entrepreneurs to overcome banks' stringent credit policies, as the result emphasize rigorous scrutiny of borrowers' financial statements (98.08% agreement among bank officers). As 98.08% among the bank officers agreed to have gathered information on the credibility of borrowers, maintaining even basic records—such as income from agriculture or small trades—can demonstrate repayment capacity. Entrepreneurs should pursue training in bookkeeping and assistance to prepare reliable financial statements, ideally maintaining a bank account with recorded transactions to substantiate their income. This aligns with banks' reliance on verified financial data, increasing loan approval chances under priority sector lending and bridging the gap created by informal rural economies.
- **Leverage Government Schemes:** Rural entrepreneurs can significantly benefit from leveraging government schemes like the Deendayal Antyodaya Yojana - National Rural Livelihood Mission (DAY-NRLM) or PMEGP to counter banks' stringent credit criteria. With bank officers adhering fully to credit manuals (100% agreement), these schemes offer a structured pathway to eligibility, often supplemented by subsidies that reduce financial risk for both borrowers and lenders. Entrepreneurs should proactively consult bank officials to understand specific requirements and align their applications accordingly. By tapping into these programs, which target priority sectors

like agriculture and weaker sections, they can offset the high scrutiny on repayment capacity (94.23%) and limited collateral, enhancing access to subsidized credit and fostering economic resilience.

Recommendations for future Researchers:

- **Define the ‘Safe Zone’ Parameters:** Future studies should quantify the "safe zone" where low CRAR and NPAs coexist with minimal risk, testing ranges across banks. Regression analysis could identify the range where CRAR increases significantly elevate NPAs, offering a benchmark for conservative banking strategies nationwide.
- **Dissect Sectoral Contributions to GSDP-NPA Link:** Researchers should examine which sector most strongly influenced the NPA drop, analyzing detailed data to uncover sector-specific effects and refine economic development strategies.
- **Combine Quantitative and Qualitative Methods:** Future researchers should combine quantitative and qualitative methods to provide a more comprehensive understanding of Risk Management Practices (RMP) and Credit Risk Management (CRM) perceptions among bank officers. Incorporating qualitative methods—such as semi-structured interviews, focus groups, or open-ended surveys—alongside quantitative data would enable researchers to explore the "why" and "how" behind the quantitative outcomes

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