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Research Paper

A STUDY ON ARTIFICIAL INTELLIGENCE IN CREDIT RISK ASSESSMENT: A STUDY OF INDIAN BANKING SECTOR

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ABSTRACT

Artificial Intelligence (AI) is transforming the credit risk assessment process in the Indian banking sector by improving the accuracy, speed, and efficiency of lending decisions. This study examines the role of AI technologies, including machine learning, predictive analytics, and big data, in evaluating borrowers' creditworthiness and reducing the incidence of non-performing assets (NPAs). It explores how Indian banks utilize AI-driven models to analyze financial and non-financial data, detect fraudulent activities, and enhance decision-making while ensuring regulatory compliance. The study also highlights the benefits of AI, such as improved risk prediction, cost reduction, enhanced customer experience, and faster loan approvals, along with challenges related to data privacy, algorithmic bias, and technological implementation. The findings indicate that AI-based credit risk assessment significantly strengthens risk management practices and contributes to greater financial stability, operational efficiency, and sustainable growth in the Indian banking sector.

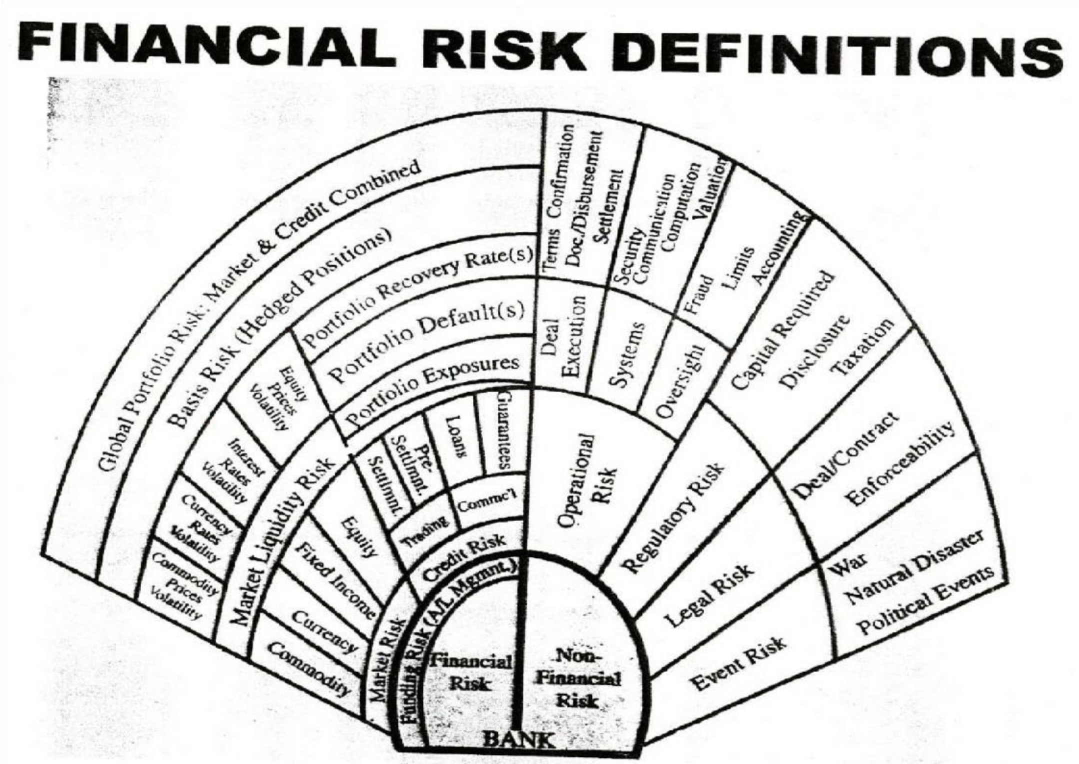
CHAPTER - I INTRODUCTION

The financial sector, especially the banking industry in many emerging economies, including India, is undergoing a transformation process. . By building a sound financial system the banking industry can bring stability to the financial markets.

Reducing regulations in the financial sector has boosted product range in the developed market. Some of the new products introduced are credit cards, real estate, exits and various non-balance sheet items. The new vistas have therefore created more banking resources to generate higher profits than traditional financial mediation. At the same time they are opening up new dangerous areas. Over the past decade, the Indian banking industry has continued to respond to emerging competition challenges, risks and uncertainties. Risks arise from the types of customer failures, gap gaps or poor market movements. Evaluating and measuring risks easily or accurately. Our regulators have made sincere efforts to bring about monitoring and regulatory procedures in line with international banking practices with a view to strengthening the stability of the banking system.

♦ Meaning of Risk and Risk Management

The etymology of the word ‘Risk’ is followed by the Latin word ‘Rescum’ which means danger at sea or what it cuts. Risk is an unplanned event with financial consequences that results in loss or reduction of earnings. It is caused by uncertainty or uncertainty about the future. Therefore, a risky proposal is one that has potential benefits or impending losses.



The Spectrum of Risks

There is a risk of unforeseen and unexpected events that have a negative impact on the bank's capital or income. In one of the publications Price Waterhouse Cooper has translated the word risk in two different ways.

Risk as Hazard:

"Risk (exposure) to loss, injury or other unfavorable condition. Exposure to business losses outside of economic activity and source of business profits.

2.LITERATURE REVIEW

Review of literature provides the roadmap to researcher who wants to study the problem and reveals the undisclosed facts and results. There have vast literature on financial performance analysis of banks through ratio analysis only but limited by CAMEL methodology. Researcher reviews the published literature on financial performance analysis through CAMEL methodology prior to conduct of research article.

Svetlana Tatuskar (2010) analyzed the financial performance of selected Indian scheduled bank through CAMEL model. They had taken a sample of five banks namely ICICI bank, SBI, Axis bank, HDFC bank and BOI for study purpose. This study found that public sector banks like BOI had done remarkable well on every CAMEL parameter. In the case of private sector banks ICICI bank was outperformed the other private sector banks. Study show that public sector bank should formulate strong structure to recover of bad-assets.

Sushendra Kumar Misra and Parvesh Kumar Aspal (2013) conducted a study to evaluate the performance & financial soundness of State Bank Group using CAMEL approach. In this study, researchers evaluate and financial performance of through twenty ratio from the year 2009-2011. They found It is found that in terms of Capital Adequacy parameter SBBJ and SBP were at the top position, while SBI got lowest rank. In terms of Asset Quality parameter, SBBJ held the top rank while SBI held the lowest rank. Under Management efficiency parameter it was observed that top rank taken by SBT and lowest rank taken by SBBJ. In terms of

Earning Quality parameter the capability of SBM got the top rank while SBP was at the lowest position. Under the Liquidity parameter SBI stood on the top position and SBM was on the lowest position. SBI needs to improve its position with regard to asset quality and capital adequacy, SBBJ should improve its management efficiency and SBP should improve its earning quality.
An another study conducted by Santosh Kumar and Roopali Sharma (2014) to evaluate performance of top Indian bank through CAMEL

3. COMPANY PROFILE

ICICI Bank is among largest private sector banks in country. It was established on Jan 5, 1955 to assist industrial enterprises in private sector. Its excellent performance is a result of its increase client focus and ability to structure financial solutions that meet client specific ends. New products, new services, new organization structures and new business models have been the hallmarks of ICICI business strategy. Risk is an integral part of the banking business and ICICI bank aim at delivery of superior shareholder value but an achieving an appropriate tradeoff between risk returns. The policies and procedures established for this purpose are continuously benchmarked with international best practices. A comprehensive range of quantitative and modeling tools are developed by dedicated risk analytic team that supports the risk management function. The risk management group, the compliance and audit group that are responsible for assessment, management and mitigation of risk in ICICI bank. These groups form a part of Corporate Center is completely independent of all business operations and is accountable to the Risk and Audit Committees of the Board of Directors. RMG is further organized into Credit Risk Management Group, Market Risk Management group, Retail Risk Management group and Risk Analytics group. CAG is further organized into credit policies, RBI Inspection and Anti- Laundering Group and Internal Audit Group.

ICICI Bank is India's second-largest private sector bank and a systemically important financial institution. Originally established as a development financial institution in 1955, it has evolved into a diversified financial services powerhouse.

4.DATA COLLECTION & ANALYSIS

CAMELS APPROACH-

The CAMELS rating system assesses the strength of a bank through six categories. CAMELS are an acronym for capital adequacy, assets, management capability, earnings, liquidity, and sensitivity.
The rating system is on a scale of one to five, with one being the best rating and five being the worst rating. (Just keep in mind that a lower rating is better, indicating a more financially stable, less at-risk bank.)

The components of CAMELS are:
(C) Capital adequacy
(A) Assets
(M) Management capability
(E) Earnings
(L) Liquidity
(S) Sensitivity

How does the CAMELS Rating System Work?

For each category, a score is given from one to five. One is the best score and indicates strong performance and risk management practices within the institution. On the other hand, five is the poorest rating. It indicates a high probability of bank failure and the need for immediate action to ratify the situation. If an institution's current financial condition falls between 1 and 5, it is called a composite rating.

- A scale of 1 implies that a bank exhibits a robust performance, is sound, and complies with risk management practices.
- A scale of 2 means that an institution is financially sound with moderate weaknesses present.
- A scale of 3 suggests that the institution shows a supervisory concern in several dimensions.
- A scale of 4 indicates that an institution has unsound practices, thus is unsafe due to serious financial problems.
- A rating of 5 shows that an institution is fundamentally unsound with inadequate risk management practices.

A higher number rating will impede a bank's ability to expand through investment, mergers, or adding more branches. Also, the institution with a poor rating will be required to pay more in insurance premiums.

Capital Adequacy

Capital adequacy assesses an institution's compliance with regulations on the minimum capital reserve amount. Regulators establish the rating by assessing the financial institution's capital position currently and over several years. Future capital position is predicted based on the institution's plans for the future, such as whether they are planning to give out dividends or acquire another company. The CAMELS examiner would also look at trend analysis, the composition of capital, and liquidity of the capital.

The below tables states the calculations of camels analysis for all the selected banks-

TABLE -1

	ADEQUACY RATIO				
2021	13		15	16		12
2022	13		15	17		11
2023	12		15	19		11
2024	13		17	18		11
2025	13		18	18		14
	12.8		16	17.6		11.8
	4	2	3	1		5

It is found from the table that KOTAK Mahindra Bank (17.6) is No.1 in CAR followed by ICICI bank (17.2) and HDFC Bank (16).

Assets

This category assesses the quality of a bank's assets. Asset quality is important, as the value of assets can decrease rapidly if they are high risk. For example, loans are a type of asset that can become impaired if money is lent to a high-risk individual. The examiner looks at the bank's investment policies and loan practices, along with credit risks such as interest rate risk and liquidity risk.

FINDINGS

- It is found from the Capital Adequacy component that KOTAK Mahindra Bank is performing better than its rival bank. ICICI and HDFC bank also performing well on Capital adequacy component.
- Further, it is found from another Assets quality component that IDBI bank performing well on Assets quality. CENTRAL BANK and SBI bank also performing well on Assets quality component.
- Study also reveals that KOTAK performing well on management efficiency followed by IDBI and CENTRAL bank.
- It is also found from earning efficiency component that CBI bank performing well followed by its rival SBI and IDBI bank.
- Overall liquidity of SBI bank and KOTAK bank is good. Overall liquidity of ICICI bank is also better.
- It is also found from Sensitivity component that kotak bank performing well followed by its rival SBI and IDBI bank.
- Considering all the banks overall performance, it has been observed that HDFC, KOTAK & SBI are well performing banks as compared to other banks like ICICI, CBI & IDBI and are less risky.
- On the basis of ranking of the banks it has been noticed that the banks standing on 5th & 6th position are highly riskier as compared to banks on 4rth position are less risky and 3rd position banks are relatively good.

OBSERVATIONS

Based on the responses to the questionnaire with senior bank officers a few major findings of study are:

- ➢ There is much greater awareness across the banking sector about the need for risk management and the various categories of risk which banks are exposed to. A separate credit risk department distinct from credit function has been set up in all the surveyed banks.
- ➢ Degree of readiness for integrated risk management among banks differs widely. As there are banks which have several years risk data and sophisticated risk models, there are also other banks, which have started the process of systematic capturing of risk data. Degree of readiness also differs with regard to the risk elements covered.
- ➢ Banks are facing significant challenge in rolling out IT networks. The banks on the software front could not entail investments in databases, data warehousing and in sophisticated statistical models as aggregation and analysis of the vast amount of data is needed for successful risk management system.
- ➢ Procedural Audit reporting risk management is not done.
- ➢ Issues relating to internal audit system, loan review system and timeliness of internal ratings are not observed in most of the banks.
- ➢ There is a lack of conceptual clarity in some of the fields of risk management.

The following recommendations are worth mentioning:

- Risk Management System should be in place to deal with current and potential risks.
  - The system needs to be developed in line with organization goals and objective.
- There should be an active participation of senior management and main line functional staff in setting up of risk management system, which will enhance the acceptability of adopting the risk management measures by the employees.
  - Procedural Audit of all banks reporting risk management should be done.
- Appropriate internal controls and audit, risk based supervision, proper manpower planning, selection training and development and efficient compliance officer should be there in addressing risk management issues.
- Monitoring and reviewing risk management process with dynamically changing global environment needs to be undertaken.
- Measuring and disclosing various risks requires sound MIS. A technological application in the form of networking and data warehousing is indispensable.
- Organization of Seminars and workshops should be conducted for training of risk management professionals as it's important not only in terms of concepts and methodologies but also to get across vital communication tools and techniques.

CONCLUSION

Risk is inherent in any walk of life in general and in financial sectors in particular. Till recently, due to regulate Environment, banks could not afford to take risks. But of late, Banks are exposed to same competition and hence are compiled to encounter various types of financial and non-financial risks. Risks and uncertainties form an integral part of banking which by nature entails taking risks.

CAMEL model provides overall performance picture of bank on different parameters from Capital adequacy to liquidity. It is found from the study that to measure and analyze the performance of bank is very interesting and challenging. Study reveals that overall performance of HDFC Bank is excellent and HDFC Bank got 1st among its rival banks. It is also concluded that KOTAK and SBI Bank performance on CAMEL component is good.

The objective of risk management is not to prohibit or prevent risk taking activity. But to ensure that the risks are consciously taken with full knowledge, clear purpose and understanding so that it can be measured and mitigated. It also prevents institution from suffering unacceptable loss causing an institution to fail or materially damage its competitive position.

Risk management and measurement in banks is very important. Though its need is enriching day by day but only some of the banks use suitable risk management and measurement techniques effectively. In near future not only banks but also companies will need to adopt risk management techniques. It is analyzed that banks need risk to be management foe effective mitigation and capital allocation. In order to gain advantage banks should develop an effective robust system and should also improve systems in which various risks are to be reported.

New technologies for risk data analysis, separate module for managing the risk such as liquidity risk, credit risk etc. should be setup by the banks. Then only banks can effectively mitigate the risks.