IMPACT OF KEY BANKING INDICATORS ON THE CREDIT RISK OF SELECTED PUBLIC & PRIVATE SECTOR BANKS IN INDIA PRIOR TO AND DURING THE COVID-19

Synopsis

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Submitted by
Tanu Sharma

Under the supervision of
Prof. Pramod Kumar

DEPARTMENT OF ACCOUNTANCY & LAW, FACULTY OF COMMERCE
DAYALBAGH EDUCATIONAL INSTITUTE (DEEMED TO BE UNIVERSITY)
DAYALBAGH, AGRA-282005

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1. INTRODUCTION

The health of the financial sector is significant, especially in developing countries where the failure of financial intermediation can hamper the development process of a nation. The main function of the financial system is to channel savings and allocate them efficiently among competing sectors and firms in the economy, and it also provides a wide range of financial services like insurance, asset management, investment, etc. The banking sector, being the most dominant segment of the financial system, plays a pivotal role in the growth of the economy; however, this sector faces various kinds of risks that not only deteriorate its financial well-being but also jeopardize the stability of the whole country. In particular, one of the risks that reduces banks' profitability and marks the onset of a crisis is credit risk. As previously stated, one of the primary functions of financial institutions is the lending of funds, which, if not paid on time, exposes them to credit risk and eventually results in non-performing assets (NPAs). Non-performing loans (NPL) represent the main challenge in the banking sector that hampers the steadiness of their operations.

Although there are many causes of credit risk, the primary ones continue to be flawed credit standards for borrowers and counterparties, ineffective portfolio risk management, or a failure to pay attention to changes in economic conditions or other factors that could worsen a bank's counterparties' credit standing. The foundation of any nation's economic development is the soundness of its financial system. Credit risk endangers banks' ability to survive. Banks should manage both the inherited credit risk across the entire portfolio and the risk associated with specific credits or transactions. They must also take into account the connections between credit risk and other risks, such as market risk and liquidity risk. The long-term success of any banking institution depends on the efficient management of risk, which includes credit risk management.

The Indian banking sector has been going through major structural changes recently. In Financial Year 2021, gross non-performing assets (GNPA) in public sector banks were approximately Rs. 6.17 lakh crore and net non-performing assets were approximately Rs. 1.96 lakh crore, whereas in private sector banks, gross non-performing assets (GNPA) were approximately Rs. 2 lakh crore and net non-performing assets were approximately Rs. 56 thousand crores (data retrieved from time-series publication of Reserve bank of India), necessitating a higher level of provisioning, which impacted

bank profitability. The surge of COVID-19 has had a negative impact on the banking industry's profitability and credit expansion; some people lost their employment and did not make their loan repayments on time, which decreased the bank's efficiency and profitability and increased the NPAs (Hawaldar et al., 2022). The Reserve Bank of India (RBI) offered the moratorium term to borrowers during the first wave of COVID-19 in FY- 2020 as protection against the suspension of business operations. Despite not offering a suspension on loan repayments during the second wave of COVID 19 in FY-2021, banks were still able to lower their non-performing assets.

1.1. CONCEPT OF CREDIT RISK IN BANKS

Credit risk is most simply defined as the potential that a bank's borrower or counterparty may fail to meet its obligations in accordance with agreed terms. (rbidocs.rbi.org.in). "It is the possibility of losses associated with diminution in the credit quality of borrowers or counterparties. (RBI Circular). Basel I, which was introduced in 1988, focused almost entirely on credit risk, and the Basel Committee on Banking Supervision defines credit risk as "the potential default of a borrower to meet the obligation in accordance with the agreed term." (BIS, 2005). Banks should have the ability to identify, measure, monitor and control credit risk (bis.org).

Financial institutions, such as commercial banks, are frequently confronted with high credit risk issues as a result of poor credit risk administration practices among banks (Takayasu et al., 2000, as cited in Yusuf et al., 2021). Credit risk is a major concern for lenders worldwide, as it is the most critical of all risks faced by the banking institution. Credit risk exists because an expected payment might not occur (Basuvaraj & Jegadeeshwaran, 2019). The major source of income for banks comes from loans granted and interest income earned from loans. By providing loans, commercial banks have the potential to become exposed to credit risk. (Yusuf et al., 2021)

1.1.1 Credit Risk Assessment

1. **Classic Credit Risk Assessment-** The basic components of this assessment are the "five C's". these are the 5 key elements a borrower should have to obtain a loan. These are as follows-

- **Capacity-** The capacity assessment indicates the borrower's ability to settle its loan on the due date.
- **Capital-** Lenders also consider any capital that the borrower puts toward a potential investment. A large capital contribution by the borrower decreases the chance of default.

- **Collateral-** The collateral serves as an alternative source for repayment of the loan if there be a failure to securitize financial exposure. This collateral must have a value to deploy and cover the loan amount (Berger and Black, 2011 as cited in Muhammad & Melemi, 2021).
- **Conditions-** The condition refers to the reason behind the loan and the state of the economic environment. This is to discover borrowers' vulnerability in the current economic situation (Daly, 2010 as cited in Muhammad & Melemi, 2021).
- **Character-** Character is considered a subjective evaluation of personal integrity of the borrower. Such assessment checks the trustworthiness and previous records of borrowing to justify its honesty in loan repayment without imposition from lenders. The generated information to be noted in observing character is the borrower's previous credit reference (Moulton, 2007 as cited in Muhammad & Melemi, 2021).

2. **Credit Scoring System-** In recent decades, quantitative systems for scoring credits have been developed. In this, the credit analyst compares various key accounting ratios of potential borrowers with industry or group norms and trends in these variables. It assigns a numerical representation of creditworthiness; the higher the number, the higher the individual's credit score.

1.1.2. Non-Performing Assets: The Narasimham Committee (1991) on "Financial System Reforms" introduced the concept of non-performing assets. For judging the health of the banking industry, the status of non-performing assets is the best indicator. These NPAs are a contributing factor to the credit risk of the banking system. (Thiagarajan et al., 2011).

According to Master circular of RBI as on August 30, 2001- A 'non-performing asset' (NPA) is defined as a credit facility in respect of which the interest and/ or instalment of principal has remained 'past due' for a specified period of time. With a view to moving towards international best practices and to ensure greater transparency, it was decided to adopt the '90 days' overdue' norm for identification of NPAs, from the year ending March 31, 2004. These are classified under four categories:

(i) **Standard Assets:** It is a performing asset that generates continuous income and repayments as and when they fall due. They are at normal risk and do not fall into the Non Performing Assets category.

(ii) **Sub-standard Assets:** All those assets that are considered non-performing for a period of 12 months.

(iii) **Doubtful Assets:** They consist of those assets that have been considered non-performing for a period of more than 12 months.

(iv) **Loss Assets:** All those assets that cannot be recovered and are identified as loss assets by the concerned bank.

1.2. KEY BANKING INDICATORS

Key banking indicators are those that disclose information about how banks are doing. This study highlights the key banking indicators that are related to bank internal operations and have a significant impact on bank credit risk. These are the following:

- **Bank Size-** This is measured by the natural log of total assets. The size of the bank plays an important role in affecting credit risk. The larger the size, the greater the ability of the banks to systemize the loan procedures and thereby reduce credit risk. On one hand, scholars document that larger banks are more likely to incur lower loan losses (Alhassan et al., 2014; Louzis et al., 2012). On the other hand, literature sheds light that larger banks consider themselves indispensable and thus, engage in riskier lending practices. These banks usually assume that they will be bailed out by the government in case of financial breakdowns (Louzis et al., 2012).
- **Bank Performance-** Kargi (2011) defined "return on assets" (ROA) as a monetary proportion that demonstrates the level of profit that an organization gains in relation to its assets. If the portfolio of loans consists more of NPAs, then there would be higher provisions for NPAs, reducing profits and consequently the return on assets (Rizvi et al., 2018). A higher ROA signals greater financial health to face shocks, and it is related to credit risk. Bhattarai (2018) found that ROA has a significant impact on non-performing assets. Likewise, Gulati et al. (2019) and Ghenimi et al. (2017) found that higher profitability lowers credit risk.
- **Capital Adequacy:** It is measured as (Tier I + Tier II capital) divided by risk-weighted assets that take into account credit risk, market risk, and operational risk. Central banks and bank regulators make the decision to prevent commercial banks from taking on excessive leverage and becoming insolvent in the process (economictimes.indiatimes.com). As per RBI norms, Indian scheduled

commercial banks are required to maintain a CAR of 9%, while Indian public-sector banks are encouraged to maintain a CAR of 12%. According to the studies conducted by Mukherjee (2003) and Sinha (2006), it was revealed that NPAs were negatively related to CAR (as cited in Rizvi et al., 2018).

- **Bank Operational efficiency:** It is generally captured by the ratio of operating expenses to total assets. Unpredicted events, such as an economic slowdown, lead to an increase in NPLs. During these economic crises, managerial efforts are doubled, resulting in extra operating costs, which in turn impact banks' cost efficiency (Berger and Deyoung, 1997, as cited in Rossi et al., 2009).
- **Loan growth rate:** It is measured by the percentage growth of total loans between two consecutive years. Credit growth is considered one of the most important influences on credit risk. Gulati et al. (2019) found that higher credit growth increases the probability of defaults in the banking sector, which signifies a negative impact of credit growth on credit risk.

2. LITERATURE REVIEW

The review of literature (ROL) provides the previous work that has been done in a particular area and also provides direction for future research that could happen in that area. This ROL is categorized as national reviews and international reviews on the basis of the origin of their publication journal and is further divided into different themes covering studies on credit risk and its determinants, the impact of bank-specific factors, studies on non-performing assets, comparative studies of public sector banks and private sector banks, and the impact of COVID-19 on the banking industry. This review of literature includes 35 reviews in total, with 13 national reviews and 22 international reviews cited properly at the end of this synopsis in the reference list.

TABLE NO. 1: NATIONAL REVIEWS

SN	Author(s)	Year & Journal	Title	Objective(s)	Research Methodology and Findings
THEME I - CREDIT RISK AND ITS DETERMINANTS					
1.	Sunitha, G., & Venu Madhav, V.	2022 Indian Journal of Finance and Banking	Client Companies' perception towards Credit Risk of Private Sector Banks with reference to ICICI, HDFC, Axis Bank, IDBI, And	To analyze and evaluate the influence of client companies' perception towards credit risk & to study the impact of	**Methodology**: This study was based on primary data gathered from 285 client companies, and statistical tools like percentage analysis, ANOVA, the chi-square

			Yes Bank.	credit risk on banks profitability.	test, and regression were used to examine the collected data. **Findings:** It found a significant influence on the client company's perception of credit risk, for which factors like consumer failure to repay the loan amount, inappropriate ratings from rating agencies, and the bank's internal rating were considered, and it also assessed the impact of credit risk on the bank's profitability.
2.	Jayadev, M., & Padma, N.	2019 IIMB Management Review	Wilful Defaulters of Indian Banks: First cut Analysis.	To assess the Credit Information Bureau (India) Limited (CIBIL) data of wilful defaulters and to examines the impact of country level governance structure on wilful defaults.	**Methodology:** It employed the common Ordinary Least Squares (OLS) time series regression approach to examine quarterly data on wilful defaulters released by the Credit Information Bureau of India Limited (CIBIL) between June 2003 and March 2016. **Findings:** According to this empirical analysis, weak country-level governance conditions are a major contributor to wilful defaulters.
3.	Ali, L., & Dhiman, S.	2019 Journal of Commerce & Accounting Research	The Impact of Credit Risk Management on Profitability of Public Sector Commercial Banks in India	To know the statistical impact of credit risk management indicators on profitability of public sector commercial banks for the period 2010-2017.	**Methodology:** The top 10 public sector banks between 2010 and 2017 were examined in this study employing panel data regression analysis. **Findings:** According to the empirical research, return on assets (profitability) is positively correlated with capital adequacy ratio, management quality, and earning capacity, while adversely correlated with asset quality and liquidity.
4.	Rizvi, N. U.,	2018 Journal	Basel I to Basel III: Impact of	To explore the theoretical	**Methodology:** Multiple regression analysis was

	Kashiramka, S., & Singh, S.	of Emerging Market Finance	Credit Risk and Interest Rate Risk of Banks in India	background of Basel III and investigate drivers of interest rate risk and credit risk in Indian banking system during 2002-2015.	utilized in this study, which covered the period from 2002 to 2015 and involved 36 listed Indian banks. **Findings:** It was discovered that a high demand for capital adequacy shows a favorable correlation between gross non-performing assets and net interest margin.
5.	Jeslin Sheeba, J.	2017 Information & Communication Technology Academy of Tamil Nadu (ICTACT) Journal on Management Studies	A study on the impact of credit risk on the profitability of state bank of India. (SBI)	To investigate the impact of Credit risk on the profitability of the bank.	**Methodology:** Multiple regression was used to analyze secondary data that was taken from State Bank of India (SBI) annual reports from 1997 to 2016. **Findings:** The research revealed that the State Bank of India's profitability is highly impacted by total credit risk (in which the non-performing assets to assets ratio alone has a significantly negative impact on return on equity).
THEME II – STUDY ON THE IMPACT OF BANK-SPECIFIC FACTORS					
6.	Al-Jafari, M. K., Altaee, H. H. A., & Adam, M. H. M.	2021 Indian Journal of Economics and Business	Bank-Specific, Government-Specific and Macroeconomic Determinants of Profitability: Evidence from the Banking Sector of Saudi Arabia.	It investigates the effect of bank-specific, government, and macroeconomic indicators on bank profitability in the Kingdom of Saudi Arabia (KSA) over the period from 2009 to 2018.	**Methodology:** Prais-Winsten and Driscoll-Kraay standard models, two panel data estimators, were used in this study's methodology. **Findings:** It was discovered that, in contrast to governmental and macroeconomic variables, bank-specific determinants were the most important elements in explaining profitability. and argued for Saudi-owned banks to put more of an emphasis on asset utilization.
7.	Agrawal, H., Kaur,	2019 Jagran	Impact of Bank Specific Factors	To check the impact of bank	**Methodology:** Stationarity testing and

	S., & Siddiquee, F.	Journal of Commerce and Economics	on Profitability: A Study of Private Sectors Banks in India	specific factors on profitability.	OLS (ordinary least squares) regression analysis were used to test the hypotheses using a sample of 15 private Indian banks with 120 observations for the period of 2011 to 2018. **Findings:** The study found a substantial cause-and-effect link between profitability and bank-specific variables.
THEME III - STUDY ON NON-PERFORMING ASSETS					
8.	Kumar, G., Jayanthi, M., Subramani, K., & Prasanth, A.	2017 ICTACT journal on management studies	An exploratory analysis on the impact of institutional-specific cum macroeconomic indicators on the non-performing assets of SBI and associate banks in India	1. To ascertain the association of institutional-specific and macroeconomic indicators with the non-performing assets of SBI and Associate Banks in India. 2. To define the impact of institutional-specific and macroeconomic indicators on the non-performing assets of SBI and Associate Banks in India.	**Methodology:** The study used multi-correlation analysis and the Granger causality test to evaluate five industry-specific and four macroeconomic factors affecting SBI and its associates from 2006–07 to 2015–16. **Findings:** The co-integration of all institutional-specific and macroeconomic factors with gross non-performing loans was confirmed by this study.
THEME IV - COMPARATIVE STUDY OF PUBLIC SECTOR BANKS AND PRIVATE SECTOR BANKS					
9.	Sanati, G., & Bhandari, A. K.	2022 National Institute of Bank Management (nibmindia.org)	Recovery Induced Operational Efficiency of Indian Commercial Banks: An Alternative Approach to Accommodate Stressed Assets as Undesirable By-products.	To estimate technical efficiency of Indian banks during 2009-10 to 2017-18.	**Methodology:** It estimated the technical efficiency of 21 public and 17 private sector banks during 2009–10 to 2017–18 and used mathematical programming-based data envelopment analysis. **Findings:** This study used mathematical programming-based data envelopment analysis and validated that public sector banks

					lag behind private sector banks and found that collateral types might be more exchangeable with liquid assets to improve the recovery of stressed assets.
10.	Mohanty, S.	2021 Parikalpana: KIIT Journal of Management	Comparative Study of Non - Performing Assets (NPAs) in selected Public Sector Banks and Private Sector Banks in India	To study the relationship Between NPA with key parameters of selected banks and to find out the impact of NPA on net profit and return on assets.	**Methodology**- From 2016–17 to 2020–21, this study took into account one public and one private sector bank. To determine whether there was a significant difference between the two, a t-test was utilized. **Findings** According to this study, the banking industry is under financial stress, and public sector banks have more non-performing assets (NPAs) than private sector banks.
11.	Basuvaraj, M., & Jegadeeshwaran, M.	2019 International Journal of Scientific & Technology Research	A Study on Measuring the Credit Risk of Select Indian Public and Private Sector Banks in the Current Scenario.	To examine the credit risk measures of the select public and private sector banks in the post financial crises period.	**Methodology-** This study employed the t-test and compound annual growth rate to analyze data from 10 public and private sector banks from 2008–09 to 2017–18. **Findings-** With the exception of cost per loan ratio, the data analysis of the post-financial period from 2008–09 to 2017–18 indicated notable disparities between public and private sector banks in terms of credit risk.
12.	Nag, A. K.	2015 Indian Journal of Accounting	Appraisal of Non-Performing Assets in Banking Sector: An Indian Perspective	To examine the asset quality and growth of non-performing assets of the nationalized banks, private and foreign banks in India	**Methodology:** This study encompassed 10 private, 10 nationalized, and 10 foreign banks during a period of five years from 2007–2008 to 2011–12, and it used percentages, averages, coefficients of variation, and one way ANOVA for data analysis.

					Findings: The study shows that compared to private sector banks, foreign and nationalized banks are more affected by NPA issues.
THEME V - IMPACT OF COVID-19 ON BANKING INDUSTRY					
13.	Luhana, G. R., & Patel, R. G.	2022 Grand academic portal	The impact of covid-19 on the Indian banking system	To study the effect of covid-19 in Indian banking industry and to find out the solution for facing the pandemic.	**Methodology:** Both primary and secondary data were used in this descriptive study. It examined many studies on the effects of COVID-19. **Findings:** It described several actions taken by the RBI and the Indian government.

TABLE NO. 2: INTERNATIONAL REVIEWS

SN	Author(s)	Year & Journal	Title	Objective(s)	Research Methodology and Findings
THEME I - CREDIT RISK AND ITS DETERMINANTS					
1.	Naili, M., & Lahrichi, Y.	2022 Heliyon (online) Open access journal by Cell press	Banks' credit risk, systematic determinants and specific factors: recent evidence from emerging markets	To explore the main determinants of banks' non-performing loans in emerging markets. (Macroeconomic, Bank specific and industry specific determinants).	**Methodology:** Between 2000 and 2019, 53 banks in the MENA non-GCC (Gulf Cooperation Council) nations of Morocco, Tunisia, Egypt, Jordan, and Turkey were included in this analysis. Panel data regression analysis was used in this work, particularly two models—a fixed effects model and a random effects model—were used. **Findings:** This study found that the main factors influencing non-performing loans are GDP growth, unemployment, bank capitalization, bank performance, bank operating inefficiency, bank ownership concentration, inflation, sovereign debt, and bank size, while loan growth, bank diversification, and

					bank size are the primary factors influencing performing loans.
2.	Goswami, A.	2022 Asian journal of Economics and Banking	Does credit risk persist in the Indian banking industry? Recent evidence	To capture the “persistence effect” of credit risk in Indian banking industry.	**Methodology:** This study used a two-step generalized method of moments (GMM) technique with bank-level data spanning a period of 19 years, from 1988-1999 to 2016-2017. **Findings:** It was discovered that if bank defaults increased the previous year, they are likely to grow this year as well because the procedure of collecting past dues takes time. Additionally, greater profitability and improved managerial efficiency, increased income diversity from non-traditional sources, optimal bank size, and accurate credit screening and oversight, as well as compliance with regulatory requirements, would aid in raising the credit quality of Indian banks.
3.	Yusuf, N. H. M., Shamsudin, M. S. M., Abdoh, W. M. Y. M., Shah, N. S. B., & Zain, R. S.	2021 Jurnal Intelek	Determinants of Credit Risk: Evidence from Commercial Banks in Malaysia	To determine the relationship between microeconomic factors with credit risk among selected commercial banks in Malaysia.	**Methodology-** From 1998 to 2017, seven Malaysian commercial banks were included in the sample. The best-fit model for the investigation was a Fixed Effect (FE) Panel Regression model. **Findings-** The study examined six microeconomic variables that affect credit risk: return on asset (ROA), bank size, leverage, the capital-to-leverage ratio, interest income, and return on equity (ROE). Leverage, interest

					income, and return on equity all had positive correlations with credit risk, whereas return on assets, bank size, and ratio of capital had negative correlations.
4.	Shndula, A. & Mazhar, S.	2020 Journal of emerging technologies and innovative research	Credit Risk Mitigation Techniques of Banks	To provide insights on the credit mitigation techniques of banks.	**Methodology:** This was a definition research study. **Findings:** It provided 2 credit risk mitigation techniques: Funded credit protection and unfunded credit protection.
5.	Ghasarma, R., Muthia, F., Umrie, M. R., Sulastri, S., & Arianto, B.	2019 Jurnal Akuntansi dan Bisnis	The Influence of Financial Inclusion on Credit Risks in Commercial Banks in Indonesia.	To analyze the effect of financial inclusion on credit risk in commercial banks in Indonesia.	**Methodology:** The population of this study, 34 banks total, included both traditional and sharia banks in Indonesia from 2011 to 2016 that were listed on the Indonesia Stock Exchange. In this study, panel data regression was used utilizing the ordinary least square (OLS), fixed effect, and random effect models. **Findings:** According to the OLS (ordinary least square) model, financial inclusion has no impact on credit risk, but according to the other two approaches, it positively affects bank credit risk, with an increase in bank credit risk occurring every year as the financial inclusion index rises.
6.	Kharabsheh, B.	2019 Academy of Accounting and Financial Studies Journal	Determinants of Bank Credit Risk: Empirical Evidence from Jordanian Commercial Banks.	To examine the main determinants of credit risk in the Jordanian banking sector.	**Methodology:** Using a balanced panel dataset of all Jordanian commercial banks from 2000 to 2017, the research looked at both bank-specific and macroeconomic variables. Three different estimate techniques were used in the study: pooled OLS

					(ordinary least square), fixed effect, and GLS (generalized least square) random effect models. **Findings:** It turned out that as the bank capital ratio, operational inefficiency, and credit growth rate all rose, so did credit risk. While the credit risk was lower for institutions that were larger and more profitable.
7.	Musau, S., Muathe, S., & Mwangi, L.	2018 International Journal of Economics and Finance	Financial Inclusion, GDP and Credit Risk of Commercial Banks in Kenya	To empirically analyzed the trade-off between Financial Inclusion and credit risk of commercial banks in Kenya.	**Methodology:** The 43 commercial banks in Kenya between 2007 and 2015 were included in this analysis. The panel multiple regression model was applied because the dependent variable was continuous. **Findings:** This study discovered that the accessibility, availability, and usage of banks significantly influenced the credit risk of commercial banks in Kenya.
8.	Chen, N., Ribeiro, B., & Chen, A.	2016 Artificial Intelligence Review- Published by Springer Nature	Financial credit risk assessment: a recent review.	To review the recent studies in financial risk assessment.	**Methodology:** This study employed a variety of conventional statistical methods, including factor analysis, multivariate discriminant analysis (MDA), quadratic discriminant analysis (QDA), linear discriminant analysis (LDA), and logistic regression (FA). **Findings:** It examined both traditional and advanced methodologie s and reviewed recent research on financial credit risk assessment. It also provided illustrations of some of the study's primary

					themes.
9.	Tehulu, T. A., & Olana, D. R.	2014 Research Journal of Finance and accounting	Bank- Specific Determinants of Credit Risk: Empirical Evidence from Ethiopian Banks	To examine the bank-specific determinants of credit risk in Ethiopian Commercial Banks.	**Methodology:** On 10 commercial banks between 2007 and 2011, generalized least squares regression was performed. **Findings:** The study found that credit growth and bank size have negative and statistically significant effects on credit risk, whereas operating inefficiency and ownership have positive and statistically significant effects. It also showed that profitability, capital adequacy, and bank liquidity have negative but statistically insignificant effects on credit risk.
10.	Nabila, Z., & Younes, B. N.	2011 Journal of Accounting and Taxation	The factors influencing bank credit risk: The case of Tunisia	To analyze the internal and external factors determining the levels of bank credit risk-taking in Tunisia	**Methodology:** Panel data regression analysis was used in this study, which covered 10 commercial banks from 1995 to 2008. **Findings:** According to the study, ownership structure, prudential capital regulation, profitability, and macroeconomic variables are the primary drivers of bank credit risk in Tunisia.
THEME II – STUDY ON IMPACT OF BANK-SPECIFIC FACTORS					
11.	Basheer, M. F., Hidthiir, M. H., & Waemustafa, W.	2019 Asian Economic and Financial Review	Impact of Bank Regulatory Change and Bank Specific Factors Upon Off-Balance-Sheet Activities Across Commercial Banks in South Asia	It provides details about factors that determine off balance sheet activities of South Asian commercial banks mainly in India, Bangladesh and Pakistan.	**Methodology:** From 2013 to 2017, this study used panel data methodology on 21 conventional commercial banks in Pakistan, 29 conventional banks in Bangladesh, and 31 conventional banks in India. It accomplished so using fixed effect and Arellano-Bond models. Moments-based

					generalized approach, notably for data analysis. **Findings:** The study discovered a substantial and positive association between loan ratio and off-balance sheet activities (OBSA), which is consistent with the market portfolio theory, which contends that increasing the number of loans can increase credit risk continuously.
12.	Sackitey, D. T., & Ndwiga, T.	2016 Texila International Journal of Management	A Critical Analysis of Key Financial Performance Indicators in the Banking Industry in Ghana	This study seeks to critically explore the key financial indicators in the banking industry.	**Methodology**: This study used various financial ratios to compare Ecobank Ghana's performance between 2005 and 2015. **Finding:** According to this study, the primary financial performance measures of banks are profitability (as measured by return on assets and return on equity), liquidity performance, and asset credit quality.
THEME III - STUDY ON NON-PERFORMING ASSETS					
13.	Pundir, A., & Choudhury, S.	2021 Turkish Journal of Computer and Mathematics Education	A Systematic Review on Non-Performing Assets in Banks in India	To review the literature published on NPAs, their future research scope and their determinants.	**Methodology:** The literature that has already been published on NPA (non-performing assets) in India was extensively evaluated for this meta-analysis study. **Findings:** Only 15 out of 362 papers assessed by Web of Science and Tayler & Frances discussed non-performing assets, and the majority of those articles were about other nations. This suggests that there is need for research on NPA in India.
14.	Khan, M. A.,	2020 Asian Journal of	Determinants of non-performing	This study aims at scrutinizing the	**Methodology:** Between 2005 and 2017, the

	Siddique, A., & Sarwar, Z.	Accounting Research	loans in the banking sector in developing state.	determinants of Non-Performing Loans observing a case of the banking sector in Pakistan over the period from 2005 to 2017.	banking sector was investigated and estimates were made on the Pakistan Stock Exchange. using STATA software and regression modelling with random and fixed effects. **Findings:** On non-performing loans, operating efficiency and profitability had a significant negative association, although capital adequacy and income diversification had a negligible impact.
15.	Chen, F. W., Feng, Y., & Wang, W.	2018 Sustainability-Cross-disciplinary and open access journal by Multidisciplinary Digital Publishing Institute. (MDPI)	Impacts of Financial Inclusion on Non-Performing Loans of Commercial Banks: Evidence from China	It discusses the possible associations between financial inclusion and non-performing loans of commercial banks in China on the regional level.	**Methodology:** From 2005 to 2016, China's 31 provinces (including 4 municipalities) were applied to the panel data model. **Findings:** The empirical data (from a large national sample) showed that financial inclusion has a negative effect on non-performing loans.
THEME IV - COMPARATIVE STUDY OF PUBLIC SECTOR BANKS AND PRIVATE SECTOR BANKS					
16.	Ahmed, D. R. & Baranwal, G.	2021 International Journal of Accounting & Finance Review	Determinants of credit risk	To empirically examine the impact of managerial effectiveness on the credit risk of the Indian public and private sector banks.	**Methodology:** The study's nine-year duration, from 2010 to 2018, involved 40 banks. To analyze the impact, a fixed effects and dynamic panel data model was utilized. **Findings:** It appeared that managerial effectiveness as determined by return on assets had a negative impact on credit risk.
17.	Mittal, R. K., & Suneja, D.	2017 International Journal of Management, IT & Engineering	The problem of Rising Non-Performing Assets in banking sector in India: Comparative analysis of	To find out quantum of NPA and the impact of NPAs on bank's performance in Public and Private sector banks in India.	**Methodology-** The compound annual growth rate was used in this study's methodology to assess NPA growth in a sample of public and private sector banks

			Public and Private sector banks		from 2005 to 2016. **Finding-** According to the study, NPA in public sector banks is growing in size.
18.	Singh, S.	2014 GE-International Journal of Management Research	Appraisal of Credit Risk Identification practices of selected Public and Private Sector Banks	To analyse and compare the credit risk identification practices of selected public and private sector banks in India	**Methodology:** T-statistics and an ANOVA were employed for analysis in this primary study, which included 50 respondents from each of the 11 banks from the public and private sectors that were chosen. **Findings:** With regard to the governance structure for identifying credit risk and the internal control system for dealing with credit risk, various public sector banks demonstrated significant differences in bankers' perspectives, but not with regard to the procedure and process to implement credit risk policies. There were no appreciable differences in respondents' opinions regarding the internal control system for promptly handling credit risk and the procedures and processes to put the credit risk policies into practice when it came to private sector banks.
19.	Thiagarajan, S., Ayyappan, S., & Ramachandran, A.	2011 European Journal of economics, Finance and Administrative Sciences	Credit Risk determinants of Public and Private sector banks in India	To predict the determinants of credit risk in Indian Commercial Banks.	**Methodology:** A linear regression model and an econometric model were used to analyze panel data on bank-specific variables that were gathered for 22 public and 15 private sector banks in India between 2001 and 2010. **Findings:** For both types of banks, it was discovered that GDP

					(gross domestic product) and credit risk are negatively correlated with lagged non-performing assets and significantly positively correlated with current non-performing assets.
THEME V - IMPACT OF COVID-19 ON BANKING INDUSTRY					
20.	Hawaldar, I. T., Meher, B. K., Kumari, P., & Kumar, S.	2022 Banks and Bank Systems	Modelling the effects of capital adequacy, credit losses, and efficiency ratio on return on assets and return on equity of banks during COVID-19 pandemic	To determine the impact of Capital Adequacy Ratio, Credit Losses Ratio and Efficiency Ratio on the two significant profitability ratios, namely Return on Assets (ROA) and Return on Equity (ROE), during the pandemic	**Methodology**- The study covered all Indian banks listed on the NIFTY 100 between January 2020 and June 2021, including ten private sector banks and 13 public sector banks. Fixed Effect Panel Regression was used to evaluate the hypotheses. **Finding-** It was found that the capital adequacy and efficiency ratios had a significant inverse impact on return on assets.
21.	Haribhau, B. J.	2021 IOSR Journal of humanities and social science	Impact of Covid-19 on Indian banking	To analyze the effect of covid-19 on different aspects of Indian banking sector	This study explained the effect of covid-19 on many aspects like loan book, credit-GDP ratio, flow of funds to commercial sector, maturity profile of assets and liabilities, off-balance sheet operations, capital adequacy and many other.
22.	Prasanth, S., & Sudhamathi, S.	2020 International Journal of Disaster Recovery and Business Continuity	Customer Perception on Payment of Loans During Covid-19: Empirical Study on Indian Bank	To study the profile of defaulting borrowers of Indian Banks and analyzing their perception of Non-performing Assets during Covid 19.	**Methodology:** To determine the relationship between demographic parameters and the stated purpose of the loan for defaulting borrowers, this study conducted a chi-square test on primary data containing 8 demographic variables collected from selected defaulting borrowers of Indian Bank in Pudukkottai. **Findings:** This study's

					findings indicate that cost overruns are the main reason for loan default.

3. RESEARCH GAP

After going through the literature review, the researcher found many studies covering different themes as mentioned in the ROL of this study; however, this study is mainly focused on the impact of key banking indicators on the credit risk of selected banks, so in that aspect, the researcher has found studies that covered two kinds of factors that influence credit risk: the first is related to bank-specific variables, and the second is macro-economic variables. **(Al Jafari et al., 2021; Jayanthi et al., 2017; Naili & Lahrichi, 2022)** and there were some that focused only on bank-specific factors **(Yusuf et al., 2021; Kharabsheh, 2019; Tehulu & Olana, 2014)**, but most of these studies were done outside India, and those in India only covered a particular bank or a particular category of bank. The researcher discovered no study in India that assessed the impact of key banking indicators on credit risk of public and private sector banks in India during the COVID-19 period, indicating a research gap.

4. SIGNIFICANCE OF THE STUDY

Due to the unpredictable atmosphere, banks face various risks like credit risk, market risk, operational risk, liquidity risk, etc., which affect the survival of banks, as can be seen in today's scenario. The majority of Indian banks lack effective tools for managing credit risk, which worsens the issue of non-performing assets and lowers the yield on advances as well as the profitability of the banks. Banks face a significant credit risk in the form of non-performing assets when they are unable to collect the loan they have extended.

This study will be useful in identifying the various factors that raise exposure to credit risk. It will analyze the impact of key banking indicators on credit risk, which will help in identifying the factors that most affect exposure to credit risk so that proper management and corrective measures can be taken. Because COVID-19 has had a negative impact on almost every sector, this study will attempt to assess the impact of the pandemic on the banking sector, specifically in public and private sector banks in India.

5. RESEARCH QUESTIONS OF THE STUDY

This study asks the following questions to be answered:

- What are the policies and procedures that are followed by banks for the assessment of their credit risk?
- What are those key banking indicators that majorly affect the credit risk at selected banks?
- Which variable has the greatest influence on credit risk for selected banks?
- What are the causes of the disparities in NPA levels between public and private sector banks?
- How a pandemic can affect the credit risk of banks?

6. OBJECTIVES OF THE STUDY

The study will be conducted keeping in mind the following objectives:

1. To study the key banking indicators and credit risk assessment policies and procedures followed by selected banks and the credit risk policy framework specified by the RBI.
2. To analyze the impact of key banking indicators (covering bank size, bank performance, capital adequacy, bank operational efficiency, and loan growth rate, independently and jointly) on the credit risk of selected public sector banks in India.
3. To examine the impact of key banking indicators (covering bank size, bank performance, capital adequacy, bank operational efficiency, and loan growth rate, independently and jointly) on the credit risk of selected private sector banks in India.
4. To compare the impact of key banking indicators (covering bank size, bank performance, capital adequacy, bank operational efficiency, and loan growth rate) on the credit risk of selected public and private sector banks in India.
5. To assess the impact of COVID-19 on the credit risk of selected public and private sector banks in India.

7. HYPOTHESES OF THE STUDY

On the basis of the objectives of the study, the following hypotheses have been formulated:

$H_0$1. There is no significant impact of key banking indicators (independently and jointly) on the credit risk (conveyed by the level of NPLs) of selected public sector banks in India.

$H_0$2. There is no significant impact of key banking indicators (independently and jointly) on the credit

risk (conveyed by the level of NPLs) of selected private sector banks in India.

H_o3. The credit risk of selected Indian public and private sector banks is not significantly impacted by COVID-19.

8. RESEARCH METHODOLOGY

8.1. SAMPLING DESIGN

8.1.1. Sample Size-

This study includes 24 banks in total in which **12 Public Sector Banks** viz; State Bank of India, Bank of Baroda, Punjab National Bank, Canara Bank, Bank of India, Union Bank of India, Central Bank of India, Indian Bank, Indian Overseas Bank, UCO Bank, Bank of Maharashtra & Punjab and Sind Bank.

And **12 Private Sector Banks** viz; ICICI Bank Ltd, HDFC Bank Ltd, Axis Bank Ltd, Kotak Mahindra bank Ltd, YES Bank Ltd, Federal Bank Ltd, Jammu & Kashmir Bank Ltd, Karur Vysya Bank Ltd, Karnataka Bank Ltd, South Indian Bank Ltd, City Union Bank ltd, Tamilnad Mercantile Bank Ltd.

8.1.2. Criteria of Sample Size:

The selection of the banks is made on the basis of their existence throughout the period of this study as available in the list of the Reserve Bank of India. Banks have been facing privatization, nationalization, and mergers for a very long time, and in recent times mergers are taking place in the banking industry at a fast pace. There is no surety that a bank will be in its same position in a period of six years due to the reasons of mergers, privatization, or nationalization, and in that case, it will not show a good result. So, for better findings, the researcher has used the basis of existence for the sample selection.

8.1.3. Duration of the study:

Six financial years will be taken into consideration for the purpose of this study, commencing from the financial year 2017–18 to the financial year 2022–23. Because this study is being conducted during a time period that includes the pandemic effect and also analyses the impact of COVID-19 on the credit risk of public and private sector banks, the researcher has chosen a 6-year period in which the period from 2017–2018 to 2019–20 belongs to the pre-pandemic period and the period from

2020–21 to 2022–23 belongs to the period during which the maximum effect of COVID–19 could be seen.

8.2. DATA COLLECTION: For the purpose of this study secondary data will be taken in to consideration:

Secondary Data:

Present study will focus on data available in Annual reports to be collected for financial years 2017-18 to 2022-23.

Source of Data: Data will be collected from the website of selected banks and many other different websites which includes Reserve Bank of India, Ministry of Finance, Ministry of Corporate Affairs, Data Available in Hardcopies, Reports on trend and progress of banking in India, Newspapers, Research Articles, Research Journals, E-Journals, Books and Magazines.

8.3. TOOLS FOR DATA ANALYSIS:

Various descriptive statistical tools such as mean, median, standard deviation, etc.; correlation; and tests of significance such as the independent group t-test will also be used for this study.

For analyzing the data, **multiple regression analysis** will be the main statistical tool. The dependent and independent variables for the same will be as follows:

Credit Risk as Dependent Variable & Key Banking Indicators as Independent Variable (to be studied independently and jointly)–

TABLE NO. 3: DIFFERENT VARIABLES WITH THEIR EXPLANATION

S.No.	Variable	Proxy	Explanation	Reference/ Source of data
1.	Credit Risk (Dependent)	Non-performing Loan (NPL)	Non-Performing Loans to Total Loan (%)	B. Kharabsheh (2019), Vouldis and Louzis (2017)
2.	Bank Size (Independent)		Natural logarithm of total asset	Naili & Lahrichi (2022), Yusuf et al (2021), Mensah and Adjei, 2014).
3.	Bank's Performance (Independent)	Return on Assets	Net income to total Assets (%)	Ozili (2019)
4.	Capital Adequacy (Independent)		(Tier 1 + Tier 2 capital) to risk weighted assets (%)	Muhammad et al. (2020), B. A. Iqbal & Shaista Sami (2017)
5.	Bank Operational efficiency (Independent)		Total operating expenses to total assets (%)	Naili and Lahrichi, 2020, B. Kharabsheh (2019)

6.	Loan Growth rate (Independent)		Percentage growth of total loans between two consecutive years	B. Kharabsheh (2019)

Multiple Regression Equation:

The multiple regression equation for this study will be as follows:

$$CR_{it} = b_0 + b_1BSIZE_{it} + b_2BP_{it} + b_3CAR_{it} + b_4OEFF_{it} + b_5LGR_{it} + e$$

where, i and t represent cross-section dimension and time indicator.

b_0- Constant term

b_1 - b_5 are the coefficients of independent variables.

e - Error term

Credit risk (CR) is the dependent variable, while BSIZE, BP, CAR, OEFF, and LGR, representing bank size, bank performance (return on assets), capital adequacy ratio, bank operating efficiency, and loan growth rate, respectively, act as independent variables. The main objective of the study is to identify the most significant determinant of credit risk in public and private sector banks in India.

8.4. TOOLS FOR PRESENTATION: The researcher will use tables, charts, graphs, etc. for showing the trends as presentation tools.

9. OBJECTIVE WISE RESEARCH METHODOLOGY

TABLE NO. 4: OBJECTIVES WITH THEIR RESEARCH METHODOLOGY

S.NO.	OBJECTIVE	RESEARCH METHODOLOGY
1.	To study the key banking indicators and credit risk assessment policies and procedures followed by selected banks and credit risk policy framework specified by the RBI.	To fulfil this objective, the websites of selected banks and the RBI will be used, and the researcher will also collect the required information through the headquarters and regional offices of major banks in both sectors.
2.	To study and analyze the impact of key banking indicators (covering bank size, bank performance, capital adequacy, bank operational efficiency, and loan growth rate, independently and jointly) on the credit risk of selected public sector banks in India.	To accomplish this objective, the researcher will use descriptive statistical tools like mean, standard deviation, etc., correlation, and for the impact analysis of the data, a multiple regression model will be used.
3.	To examine the impact of key banking indicators (covering bank size, bank performance, capital adequacy, bank operational efficiency, and loan growth rate, independently and jointly) on the credit risk of selected private sector banks in India.	To execute this objective, the researcher will use different descriptive as well as inferential statistical tools, with multiple regression analysis as a major tool.

4.	To compare the impact of key banking indicators (covering bank size, bank performance, capital adequacy, bank operational efficiency, and loan growth rate) on the credit risk of selected public and private sector banks in India.	To achieve this objective, the researcher will do comparative analysis both through graphs and tables and will also use an independent group t-test and other tools as needed.
5.	To assess the impact of COVID-19 on the credit risk of selected public and private sector banks in India.	To attain this objective, the researcher will use yearly growth percentage, trend analysis, and other inferential tools to assess the impact of COVID 19.

10. PROPOSED CHAPTER PLAN

TABLE NO. 5: CHAPTER NUMBER WITH THEIR TITLE

CHAPTER NUMBER	TITLE/COVERAGE
CHAPTER 1	Introduction
CHAPTER 2	Literature Review & research methodology
CHAPTER 3	Role of key banking indicators and credit risk assessment policies and procedures followed by selected banks and as specified by the RBI. (Objective 1)
CHAPTER 4	Impact of key banking indicators on the credit risk of selected public and private sector banks in India. (Objective 2 & 3)
CHAPTER 5	Comparing the impact of key banking indicators on the credit risk of selected public and private sector banks in India. (Objective 4)
CHAPTER 6	Impact of COVID-19 on the credit risk of selected public and private sector banks in India. (Objective 5)
CHAPTER 7	Analysis and Interpretation
CHAPTER 8	Findings and Conclusion

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