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Research Article

Credit Risk Management and Nonperforming Assets: A Study in Commercial Banks in India

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ABSTRACT

Purpose: The goal of this article is to analyze how different elements of credit risk affect the efficiency with which commercial banks in India handle credit risk and the rate at which their NPAs increase.

Research Design:The information comes from both primary and secondary resources. The risk managers of Indian banks fill out a survey to provide the bulk of the data. The Centre for Monitoring the Indian Economy uses the annual reports of Indian banks and the Prowess database to produce secondary data on nonperforming loans. The models for the research are estimated using multiple linear regression.

Findings: Based on the data, it appears that credit risk identification has a major impact on credit risk performance. The annual growth in nonperforming assets (NPAs) and loans is adversely correlated with credit risk identification, hence the findings are reliable. Private banks have been shown to have superior performance in terms of credit risk compared to their government counterparts.

Practical implications: Implications for Indian banks with large bad loan losses were found in the study. It will also affect the Reserve Bank of India's plans to implement the latest Basel Accord standards (Basel III).

Social implications:If the government and central bank don't act to reduce the large and rising number of NPAs by bolstering institutional and regulatory infrastructure, it would have a detrimental impact on credit flow in the economy, reduced industrial and aggregate economic growth, as well as reduced (or negative) employment growth, will result from the difficulties in the banking and financial services industry.

Originality/value:There is a gap in our understanding of the causes and effects of the rise in nonperforming loans in India and the credit risk management practices of Indian banks. Given the large and rising NPAs of Indian banks and the ramifications for the Indian economy, the necessity for an efficient risk management system to control credit risk gains relevance and urgency.

Keywords: Indian banks, Risk management, Ownership, Credit risk, Risk identification, Non-performing assets

INTRODUCTION:

In within 30 years, India has become a major economic power (Didier &Schmukler, 2013). India's financial industry is substantially smaller than the average of the nation groups outlined by La Porta et al., despite the country's inheritance of formal legal systems extending back more than two centuries (1997) [1]. Banks are underutilized in terms of providing loans despite their small size and low operating expenses (Allen et al., 2012).

Banerjee et al. (2004) and Love and Peria (2005) both find that bank credit is the most common source of funding for Indian businesses. India is a perfect environment for this study because its main commercial bank has been successful for over two hundred years, and its stock exchange is one of the oldest in Asia (approximately 130 years)

(Allen and Qian, 2010). Since banks in India are the primary source of financing, their importance is only likely to grow as Indian businesses grow and expand their activities abroad. In order to operate, these businesses need capital that is low in relation to international standards; as a result, foreign banks may be hesitant to provide this cash (Banerjee et al., 2005). Therefore, domestic banks in these countries need to grow larger and adopt internationally recognized best practices to remain competitive with their foreign counterparts.

The efficient categorization of (risk) assets has helped the world's largest banks earn a reputation for effective risk management, particularly in the area of credit risk (Treacy & Carey, 2000). In contrast, Indian banks only use four categories (standard, sub-standard, dubious, and loss assets) to classify their NPAs, or non-performing (loss) assets. Indian financial institutions are working hard to raise their risk management standards to match those of other major economies (Scott, 2003). A step in that direction would be the adoption of more stringent provisioning criteria for international banks and the earlier identification of credit risk. The goal of this research is to better understand the components of Indian banks' credit risk management systems.

Credit risk management in banks has been the subject of a growing body of theoretical and empirical research (Altman and Saunders, 1997; Crouhy et al., 2000; Saunders and Allen, 2002; Muninarayanappa, 2004; Fatemi and Fooladi, 2006; Joetta, 2007). However, these studies are limited to its components (Al-Tamimi, 2002; Fatemi and Fooladi, 2006; Al-Tamimi and Al-Mazrooei, 2007), ownership (Al-Tamimi and Al-Mazrooei, 2007; Bhaumik and Piesse, 2007; Pennathur et al., 2012; Arora, 2014), NPAs (Salas and Saurina, 2002; Ranjan and Dhal, 2003; Das and Ghosh, 2007; Sanjeev, 2007) and deficiencies (gaps) in credit risk management in banks (Salas and Saurina, 2002; Sanjeev, 2007).As developing economies progress, so does the chasm in our understanding of credit risk management and its constituent parts. Another drawback is that there is no persuasive explanation of the relationship between credit risk indicators and outcomes in the present literature.

Since the financial sector has undergone significant changes in recent decades (Miller, 1986), this study takes on further significance. These changes raise the bar for, and add complexity to, banks' ability to evaluate, manage, and control risk. Banks must adopt a unified strategy for managing their assets, liabilities, and risks in light of the recent regulatory changes and heightened market volatility. Banks and other financial organizations are beginning to realize the importance of setting aside sufficient funds for risk management.

The banking, financial services, and insurance (BFSI) sector has taken a severe hit from recent global economic downturns (such as the US Subprime Mortgage Crisis and the Great Recession).The Indian banking, financial services, and insurance (BFSI) industry faces rising levels of nonperforming assets (NPAs) and corruption.Banks have suffered significant losses due to promoters' dishonesty in the past (such as Kingfisher Airlines' Mr. Vijay Mallya). These large loans are usually approved through a consortium or a series of separate lending agreements. The rising number of bad loans may be the result of unforeseen shifts in the business climate or internal issues. Is the escalation (of NPAs) the result of banks' internal errors in due diligence, or the result of the growing complexity of modern businesses generally?

Banks' methods for handling credit risks

Several massive losses have occurred in the financial services sector over the past two decades due to ineffective risk management and control systems (Claessens and Kose, 2013).Threats to the financial system, such as credit risk, market risk, operational risk, and others, are always present. Research shows that credit risk accounts for almost half of all hazards in the banking industry and the financial sector as a whole (Heffernan, 2005). In order to increase their economic rent, banks are reducing their exposure to tradable risk via derivative hedging while concurrently increasing their exposure to credit risk via loan expansion (Deng et al., 2016).

The present financial crisis, which has its origins in the default on U.S. subprime mortgages but has subsequently expanded to other sectors and countries with substantial leverages, is the biggest financial crisis since the Great Depression of the 1930s (Kim and Renaud, 2009).After major financial institutions like Lehman Brothers went bankrupt, authorities around the world are suggesting solutions to restore stability to the financial markets. As a result, governments and financial sector authorities have had to prioritize strengthening the world's credit risk management system (Roach, 2009).

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Because of the expansion of international capital flows enabled by the globalization of financial markets, national boundaries are becoming irrelevant. U.S. investors, for instance, may feel the effects of a policy shift made by, say, the German Federal Reserve. Therefore, in order to have better loan quality, a good risk management system should have adequate credit risk environment, policies, and regulations (Muninarayanappa, 2004).

The study's overarching objective is to examine the effects of various elements of credit risk management on the overall performance of Indian banks.Saunders and Allen (2002) note that a growing economy is characterized by rising pressures of globalization, liberalization, consolidation, and deregulation, as well as increased global competition. This study contributes to this understanding by emphasizing the importance of credit risk management in this context. Various parties will be interested in our findings. In an effort to reduce the amount of poor and dubious assets held by banks under their supervision, central banks may put more emphasis on credit risk identification (CRI). Credit risk can be reduced if the risk managers put in the time and energy required to thoroughly assess the financial stability of prospective borrowers. Bank executives can learn from one another by pooling data on the creditworthiness of prospective borrowers and their knowledge of how to spot hazardous borrowers early on. By working together, banks can reduce the overall amount of nonperforming loans in the financial system, which in turn could increase lending to various industries.

At last, the study has relevance for financial institutions, which suffer heavy losses as a result of credit defaults. Also affected [2] is the Reserve Bank of India's (RBI) ability to comply with the new Basel Accord (Basel III) standards.

The paper will proceed as described below. In Section 2, we explain what prompted this research.

In Section 3, we briefly examine the existing information and then pinpoint an area where more study is needed. In Section 4, the research methodology is described, and in Section 5, the findings are discussed. Section 6 contains the study's findings and their implications.

2. REASONS FOR DOING THE RESEARCH

2.1 India's Large Economic Impact

Over the past 15 years, India's economy has expanded significantly as the country has moved from a planned to a market economy. The World Bank forecasts India's GDP at $ 2,264 billion for 2016, up from $1,657 billion in 2010 and $920 billion in the preceding fiscal year. GDP grew by 9.26 percent, 10.3 percent, and 7.1 percent in 2017, according to data from the World Bank.

Mobilizing funds and allocating them efficiently among competing sectors/firms in the economy is the fundamental task of the financial system. The financial markets in most developing countries are dominated by banks, while capital markets appear somewhat later. Even in India's banking sector, a sizable minority (about 33%) of Deposits at banks and other financial institutions account for the vast majority of people's savings (Sharifi et al., 2016). Managing credit risk is crucial for India's banking sector because of the country's large number of small deposit accounts.

Large nonperforming assets (NPAs), especially in government banks (PSBs), are an indication of the instability in the Indian banking industry induced by these challenges (Azad et al., 2016).

This has a negative effect on banks' ability to lend, which in turn hinders the growth of India's economy. Therefore, it is critical for the development of India's banking and economic system that credit risk be properly identified and estimated.

2.2 The Increasing Non-Performing Assets of Indian Banks

Since banks must keep their capital adequacy at a minimum, a high rate of nonperforming loans (NPAs) can reduce their overall wealth. If banks aren't making enough money, they might have to start using their reserves. Over the past few years, nonperforming loans (NPDs) have been a major problem for India's banking sector. According to research by Cashin et al. (2017), the Nonperforming Asset Ratio increased from 4.1% in March 2014 to 4.6% in March 2015 and 7.6% in March 2016.

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According to the macro stress tests in RBI's (2016) financial stability report, the GNPA may climb to 8.5% by March 2017 under the baseline scenario. The GNPA ratio is projected to rise to 9.3 percent by March 2017 (RBI, 2016), which could happen if future macro conditions worsen. The ratio of gross nonperforming assets (GNPA) to total assets may continue to be greatest for government-sponsored banks (PSBs). However, if banks' loan assets experience a severe deterioration in credit quality, this ratio could worsen dramatically.

3. REVIEW OF LITERATURE

Risk management is a field with a wealth of evidence (Joetta, 2007; Hull, 2012; Bessis and O'Kelly, 2015, etc.). Credit risk management is essential in any industry, but it is especially important for banks (Fatemi and Fooladi, 2006).

3.1 Non-Partial Atrophy

Over the past two decades, competition between banks in the Euro Zone markets has increased thanks to deregulation (Salas and Saurina, 2003). According to the available research, banks were under significant pressure due to fierce rivalry, which in turn led to problematic loans and substantial NPAs. High credit risk and nonperforming assets (NPAs) emerged from this pressure (see, for example, Manove et al., 2001; Bolt and Tieman, 2004; Jeong and Jung, 2013).

Salas and Saurina (2002) analysed the factors that led to troubled loans at Spanish savings and commercial banks using macroeconomic parameters from 1985 to 1997.Their research shows that district-to-district bank mergers can be beneficial, that bank ownership and competition are key, and that bank supervision strategy has a significant influence in determining credit risk.

Bad loans in state-owned banks in India were studied by Das and Ghosh (2007), who looked at the causes from 1994 to 2005 and considered both macro and micro issues. Based on their findings, real loan growth, operating expenses, and bank size all play significant roles in influencing the macro and micro levels of problematic loans.

A risk's presence (whether internal or external) is more important than the risk's kind (whether financial or economic), according to Sanjeev's (2007) research. According to his findings, bad loans are caused by external reasons more so than by internal ones. Recessions in the economy and intentional defaults are seen as the two most important outside influences. However, the available data implies that credit manager incentives, abilities, and other internal aspects Bad loans in Indian financial institutions are less affected by cost-cutting, staffing, government/political intervention, or budgetary constraints due to a lack of adequate assessment of collateral.

The economic elements that were found to affect banks' NPAs were analyzed in these reports. However, according to Ranjan and Dhal (2003), NPAs are determined by a mix of financial and economic factors. NPAs of Indian commercial banks are strongly affected by several factors (such as credit terms, bank size, and macroeconomic shocks). The maturity horizon of loans, an improved credit culture, an improving macroeconomic condition, and a conducive business environment all contribute to a decline in nonperforming loans. Consequently, we postulate:

Hypothesis 1: The growth of nonperforming assets in Indian banks correlates negatively with the institutions' ability to foresee, identify, analyse, and control credit risk.

3.2 Factors that Increase Credit Risk

Al-Tamimi and Al-Mazrooei (2007) and Hassan (2009) see risk identification as a crucial step in improving the efficiency of risk management. Credit risk management in banking institutions have revealed similar results. According to Al-Tamimi (2002), commercial banks in the UAE face a number of risks, the most disputed of which being credit risk. Based on the data presented, it appears that evaluating credit risk is an important internal consideration when evaluating loans. In addition, Indian banks face serious difficulties with their credit risk management systems when it comes to seizing and selling off collateral.

Bank managers can conduct on-site inspections, financial statement analyses, audits, and risk assessments to identify and track credit risks (Al-Tamimi and Al-Mazrooei, 2007). Similar results were found by Fatemi and Fooladi (2006) in American banks. According to their findings, the most crucial factor in credit risk modelling is

the ability to spot counterparty default risk. The cost of capital for banks in Ghana was also found to be affected by risk identification. Their banks were put in a precarious position financially as a result of problems with borrower identity, inadequate collateral, and regular default. To make up for the anticipated and unanticipated credit losses, banks charged extremely high interest rates (Kwakye, 2011).

Clear criteria and procedures for managing credit portfolios are required for an effective credit risk management system (Bank for International Settlements, 1999; Greuning and Bratanovic, 2003) in order to establish the complete process of loan allocation, appraisal, supervision, and collection. So, here's what we're speculating:

Hypothesis 2: There is a positive relationship between the efficiency of Indian banks' credit risk management practises and their risk awareness, risk evaluation, risk control, and capital requirements.

3.3 Provenance of Property

Research into banks' methods of managing credit risk has revealed some heated debates regarding ownership. Risk management procedures at domestic and international banks were compared by Al-Tamimi and Al-Mazrooei (2007). They illustrated the dissimilarities between local and foreign financial institutions with regards to risk management practises such risk assessment, analysis, monitoring, and control. The UAE's domestic banks performed better at-risk management than their overseas counterparts. Due to the high caliber of the team, foreign banks are comfortable taking on risk. It could also be because overseas banks face stricter regulatory obligations, much like their domestic counterparts do.Compared to the regulations enforced by the UAE Central Bank, these laws may be more stringent (Abu Hussain & Al-Ajmi, 2012).

According to Arora (2014), there is a major divide between public and private banks in India when it comes to the assessment of credit risk. Pennathur et al. (2012) investigated the impact of ownership on the volatility and income diversity of Indian banks from 2001 to 2009. According to the findings, the ownership structure of a bank significantly affects the emphasis placed on developing new sources of revenue. The fee income of private domestic banks exceeds that of public banks by a wide margin, whereas the fee income of international banks exceeds that of both domestic and foreign private banks. Banks' ability to avoid insolvency and default is greatly aided by fee-based income.

Using a portfolio choice model and data on individual banks from 1996 to 2004, Bhaumik and Piesse (2007) analysed the credit-market behaviour of Indian banks. According to their findings, the suggested model adequately explains data on Indian domestic banks, and it performs much better when applied to private banks. However, the model does not take into consideration the role played in India by global financial institutions. A bank's asset portfolio is a combination of safe government securities and riskier loans, with the former depending on the latter and the latter on the bank's risk aversion, past allocation models, stock market listing (for private banks), and risk tolerance.That's why it's hard to draw conclusions about the relative effectiveness of the credit risk management strategies employed by government and private Indian banks.

Hypothesis 3: Credit risk management is handled quite differently by public and private banks in India.

3.4 Research gap

When it comes to credit risk management, public and private banks in India have very different approaches.Credit risk management and ownership in Indian banks is an area that has not been studied in depth.The study set out to fill in some of the gaps in our understanding of how ownership affects credit risk management in Indian banks.

4. THE FORMAT OF A STUDY

4.1 Data

Both primary and secondary sources were used to compile this data. A survey is filled out by risk managers at Indian banks to give the bulk of the information.Secondary data on bad loans in Indian banks is mostly gathered from annual reports and the Centre for Monitoring Indian Economy's Prowess database [3].The data on nonperforming assets is from March 2012 through March 2016 for a total of 38 Indian banks (24 government and 14 private).

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4.2 Size of Sample

45 foreign banks and 27 government banks (including nationalised banks, IDBI Bank, and BharatiyaMahila Bank) are headquartered in India. Our analysis is restricted to how public and private financial institutions handle credit risk. Due to restrictions on available data, the sample consists of 24 government banks and 14 commercial banks. State cooperative banks are not included since they are only allowed to do business in certain states and are subject to oversight from not just one but two agencies: The Reserve Bank of India and the Registrar of Cooperatives. In order to gather information, a questionnaire was sent out to all of India's sample banks. The total number of responses we got was 38, for a response rate of 79%. We engaged the help of the National Institute of Bank Management [4] to disseminate questionnaires to risk managers at Indian commercial banks in order to collect data for the study.

After sending out many reminders, we mailed out questionnaires to all sample banks and then personally met with their risk managers. Due to a confidentiality agreement, we cannot reveal which banks we dealt with.

4.2.1 Making a questionnaire.

There is a total of six questions in the survey. The first part of this paper consists of a survey of seven questions about credit risk management in Indian financial institutions, aimed to elicit the opinions of risk managers in such organizations.The second segment includes eight questions about CRI at Indian financial institutions. In the last segment, eight questions probe how Indian financial institutions assess credit risk. In the final section, you'll answer seven questions about managing credit risk in Indian financial institutions. In the fifth section, you'll answer 10 questions about calculating your capital needs in accordance with the standards established by the Basel (Accord). The final section includes six questions about how well Indian banks handle credit risk. We use a five-point Likert scale (from strongly disagree to strongly agree) for our closed-ended questions. The level of agreement with each question was given by the respondents. Al-Tamimi and Al-Mazrooei, 2007; Masood and Fry, 2012; Shafique et al., 2013) have been extremely helpful informing our questionnaire design. Following the advice of DeVellis (1991), the questionnaire was evaluated by a panel of four domain experts (academics) and practitioners (professionals in the field). Based on the feedback, we added, rephrased, and omitted questions from the questionnaire.

4.3 Variables

In this research, we analyse five independent variables and two proxies for the dependent variable (credit risk performance) to better understand how Indian banks handle credit risk.

4.3.1 Dependent Variables

- The nonperforming asset (NPA) growth rate information comes from the Prowess database and is verified by banks' yearly reports. We analysed the annual growth rate of Net Nonperforming Assets relative to Net Advances from 2012 to 2016.
- Credit risk performance: The term "credit risk performance" is used to describe the efficiency with which Indian banks manage their credit risks. A questionnaire consisting of six questions is used to gather information on credit risk performance.

4.3.2 Independent Variables

Independent variables are the various credit risk management aspects. In Table 1, you'll find the questions that will be used to gauge your mastery of each module.

4.4 Methodology

The models are estimated by multiple linear regression. The first model examines the relationship between the growth rate of NPAs and five potential antecedents: credit risk perception, loan-to-value ratio, interest rate, and NPA age.

In the second model, we look into how various credit risk characteristics could affect risk behaviour. In order to put our hypotheses to the test, we estimate the following models:

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where NPAGR is the rate of increase in NPAs; Performance of credit risk (CRPF), Perception of credit risk (CRP), Detection of credit risk (CRI), and Evaluation of credit risk (CRA) are the four components of credit risk management. The Credit Risk Control (CRC) and the Credit Risk Capital Requirements (CRCR) are related concepts.

Table 1. Independent Variable

S. No.	Independent Variable	Measurement
1	Credit risk perception	There are seven items on the questionnaire, all of which pertain to the risk manager's opinion of the quality of credit risk management at his or her bank.
2	Credit risk identification	There are eight questions on the survey on spotting credit risks in Indian banks.
3	Credit risk assessment	There is a total of eight questions on the questionnaire, all of which pertain to how Indian banks evaluate credit risk.
4	Credit risk control	The questionnaire comprises seven questions addressing credit risk control in Indian Banks.
5	Credit risk capital requirements	The credit risk capital needs (as per Basel criteria) questionnaire for Indian banks consists of ten items.

5. DISCUSSION AND RESULTS

5.1 Evidence-based findings

Cronbach's alpha is a measure of internal consistency that looks at the connections between questions and the total time allotted for the exam to draw conclusions about its validity.As a result, it creates a confidence interval around a composite score, using the variance and the covariance of its constituent components (Crocker and Algina, 1986).

For construct reliability, a value of 0.7 or higher is generally accepted (Nunnally, 1978). Cronbach's alpha for the entire set of six variables is close to 0.7 (Table 2). Table 2 provides estimates for the individual factors. The findings point to the dependability of the majority of the factors.

Table 2. Test of Reliability

Independent Variable	Cronbach's Alpha
Credit Risk Perception	0.68
Credit Risk Identification	0.77
Credit Risk Analysis	0.76
Credit Risk Control	0.68
Credit Risk Capital Requirement	0.86
Credit Risk Performance	0.66

Table 3 provides an overview of the data from our sample banks. Most independent variables have high means with limited dispersion. The typical CRCR score, however, is rather low. The CRCR relates to the Basel principles for determining capital needs in relation to credit risk.The lower median indicates that Indian banks are still making do with too simplified approaches to capital needs estimation.

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Table 3 Summary Statistics

Variable(s)	Mean	SD	Min.	Max.
Credit Risk Perception	4.351	0.331	3.711	5.001
Credit Risk Identification	4.362	0.381	3.382	5.002
Credit Risk Analysis	4.381	0.382	3.631	5.001
Credit Risk Control	4.282	0.381	3.572	5.002
Credit Risk Capital Requirement	3.801	0.601	1.601	5.001

Table 4 displays the correlations between each pair of independent variables. Since some of the correlation coefficients seem very high, we have checked for multicollinearity. In any case, Myers (1990) specifies a range in which even the greatest conceivable VIF score falls safely. Table 4 displays the findings of a regression study in which "NPA growth" served as the dependent variable.

Table 4. Correlation Test

Variable(s)	CRP	CRI	CRA	CRC	CRCR
Credit Risk Perception	1.001				
Credit Risk Identification	0.721	1.001			
Credit Risk Analysis	0.612	0.752	1.001		
Credit Risk Control	0.561	0.711	0.732	1.001	
Credit Risk Capital Requirement	0.232	0.301	0.511	0.411	1.001

When controlling for confounding variables, the estimated coefficient of the independent variable "CRI" is negative and statistically significant. This means that hypothesis 1 can be supported by the evidence.

The outcomes of a regression analysis with "credit risk performance" as the dependent variable are shown in Table 5.The calculated coefficient for "CRI" as an independent variable is positive and statistically significant. This means that hypothesis 2 can be supported by the evidence.

Table 5. Regression Test

Dependent Variable

Variables	NPA Growth	Credit Risk Performance
Constant	1.62 (1.78)	1.19 (1.21)
Credit Risk Identification	-0.65 (-2.54) **	0.71 (2.54) **
Credit Risk Perception	0.34 (1.22)	-0.17 (-0.51)
Credit Risk Capital Requirement	0.03 (0.39)	0.08 (0.81)
R^2	16%	29%

The final hypothesis is tested using one-way ANOVA. Table 6 displays the ANOVA findings for comparing public and private banks in India.

Table 6 One-way ANOVA test

	F-statistics	Significance
Credit risk performance	5.76	0.025

It would appear that private banks have far better "credit risk performance" than public ones.Mean values of government and private bank credit risk performance are 3.74 and 4.18, respectively (Table 7), indicating that

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private bank credit risk performance is much greater than that of government banks. Thus, the data is consistent with hypothesis 3.

Table 7 Summary statistics (ANOVA) Credit risk performance

	No. of observations	Mean	SD
Public	23	3.74	0.45
Private	15	4.18	0.43
Total	38	3.91	0.49

Banks and other financial institutions must first identify the risks they face before taking any action to mitigate them. Traditional elements of risk management, such as risk measurement, control, and mitigation, will gain from this as well, but they won't be the only ones. Stress test scenario development, risk modelling, the measurement of complex hazards, and informed strategic planning are all possible outcomes of early risk detection.

Managers benefit from the risk identification process because it illuminates the institution's most pressing weaknesses.

Incorporating risk weights to industry-specific variables that drive credit losses is possible, for example, if a bank has significant credit exposure to a single industry. This ensures more accurate assessments of potential danger.Complex hazards can be better modelled and quantified with the use of risk identification.

In addition, the narrative analysis of hazards' potential effects on an occurrence is used to simulate scenarios with little data. Credit judgement and reasonable estimations are encouraged by the Basel Committee when calculating loan losses. An impartial analysis of the bank's strategies, policies, and practises in credit sanctioning and portfolio management will help to reveal any potential sources of credit risk. The risk that a bank takes on from any one borrower or group of interconnected counterparties should be capped at prudential levels.

Credit risk should be identified and managed across the board, including for all products and services. After due diligence and board approval, proper risk management measures should be implemented for unique products and services. Complex credit decisions, such as loans to specific industries, asset securitization, and credit derivatives, necessitate in-depth study to comprehend the associated credit risk. Credit risk management fundamentals such as structured procedures and controls are needed. The bank's rules and procedures must be followed to the letter when dealing with critical issues involving counterparty credit risk. Firm and group credit limitations in the banking and trading books should be set consistently and meaningfully. In order to determine where a credit portfolio's risks are concentrated, financial institutions should implement advanced information and risk management systems. Branch managers and upper management need to regularly assess the systems' sufficiency in light of the growing complexity of the company's operations.

CONCLUSION

The success or failure of Indian banks in managing credit risk is solely dependent on the accuracy with which credit risks are identified. CRI has a strong negative correlation with the annual rise of NPAs or loans, hence the findings are reliable. The results are consistent with those of Al-Tamimi and Al-Mazrooei (2007) and others. Our results are in line with the IMF's and Cashin et al.'s (2016) emphasis on building a solid analytical framework for the early identification of risk.The results support the RBI's efforts to have banks reveal potential borrowers' profiles and credit ratings to aid in the early detection of credit risk.

The Reserve Bank of India (RBI) limits the amount of money that any one bank can lend to any one business or industry sector. By increasing provisioning needs if trouble is detected, it also inhibits lending to a particular business or sector. The RBI can check the books of banks and requires the banks to file compliance reports every two weeks. Banks are permitted to make loans to any company or consortium of companies within the bounds of the applicable regulations. As a result, it should come as no surprise that CRI is the sole factor in determining how well Indian banks manage their credit risk.

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Private banks fare much better at managing credit risk than their public sector counterparts. This makes sense when considering the autonomy afforded by private banks and their drive to outperform their competitors. Government banks are struggling because of politics and bureaucratic infighting.

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