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The Connection Between Indian Commercial Banks' Financial Performance And Risk Management For Credit Techniques

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ABSTRACT

The control of risk to credit has emerged as an essential focus concerning financial organizations due to the uncertainties inherent in the financial services sector. The volatility of the banking industry necessitates strong risk mitigation frameworks. This study evaluates "Risk management for credit and its effect on financial performance in Indian Commercial Banks." The primary objective of this research is to enhance knowledge of how return on assets (ROA) is affected by Risk management for credit.

Risk to credit remains a critical concern for financial institutions as failure by a trade partner to fulfil commitments on time may significantly affect financial stability. This study aims to explore the mechanisms employed by banks to manage their risk to credit exposure. The initial section provides a background on credit risk, while the latter part conducts a comprehensive review of literature concerning banking, risk to credit evaluation models, and management frameworks.

A quantitative research design is applied through a cross-sectional survey approach. The research analyses primary data using descriptive statistical methods and evaluates hypotheses through regression models. Findings suggest that banks implementing efficient Policies to manage risk to credit typically have significantly higher profits on assets and lower loan default rates.

Keywords: *Risk management for credit, financial performance, risk mitigation, Indian commercial banks, and banking sector, risk to credit evaluation, quantitative research.*

INTRODUCTION

Analysis of the Indian Banking System's Risk management for credit

Risk to credit is one of the most traditional and critical risks encountered by banking institutions globally. It refers to the probability of default on a debt by a borrower. Essentially, risk to credit arises when the expectation of repayment is not met. Since lending is an age-old practice, so is the associated risk of default.

In recent decades, risk to credit has grown substantially due to increased borrowing activities by individuals and businesses for expansion, acquisitions, and other financial needs. The According to its basic definition, A possibility for a counterparty or bank borrower to fail to repay on the financing is known as credit risk. The goal of Risk management for credit is to maximize a bank's risk-adjusted return while maintaining acceptable levels of exposure to credit risk. Banks must manage both individual credit risks and portfolio-level risks, while also considering interconnections with other financial risks. The long-term viability of financial institutions depends on an effective Risk management for credit system as part of a holistic risk management strategy.

Risk Management for Credit Framework

The process of managing risk to credit consists of four primary elements:

1. Determining Credit Risk
2. Monitoring and Control of Credit Risk

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3. Mitigation of Credit Risk

REVIEW OF LITERATURE

Banks strengthen their financial standing by continuously improving risk assessment mechanisms, thus securing a competitive advantage.

Bhaskar (2014) argues that risk-taking is an integral part of business expansion. Financial institutions must find a balance between risk and profitability, as increased risk exposure often correlates with higher returns. Bagchi (2003) highlights the importance of structured Risk management for credit systems, including risk identification, measurement, monitoring, and auditing.

Additional studies, such as Radhakrishna & Bhatia (2009), examined the implications of Basel II norms for Indian banks, highlighting both challenges and opportunities in adapting to international regulatory standards. Banerjee (2011) provided an overview of the evolving role of risk management in Indian commercial banking, emphasizing the growing importance of financial professionals in mitigating risk.

OBJECTIVES OF THE STUDY

1. To assess current Risk management for credit practices in Indian banks.
2. To identify areas for improvement and propose recommendations.
3. To explore training methods for bank managers in creditworthiness assessment.
4. To establish a standardized framework for evaluating risk to creditand its impact on financial stability.

METHODS OF RESEARCH

This study adopts a quantitative research design, utilizing secondary data sources such as bank financial statements, regulatory reports, and academic publications.

Panel data from 19 banks across India and Pakistan from 2009 to 2018 is used in the analysis. To address potential endogeneity and autocorrelation issues, the Generalized Method of Moments (GMM) model is employed alongside ordinary least squares regression.

Definition of operations risk to credit. The likelihood of lenders defaulting, elevated risk to credit, and higher bank FP (Louzis et al., 2012). According to Chimkono et al. (2016), bank-specific factors are those that are within the management of commercial banks' control.

loans that are not performing. When the loan's lifetime has elapsed and banks are unable to obtain the main amount and interest payment for 90 days, the loan is considered nonperforming (Hamza, 2017).

		Name of variable	Symbol	Measurement
Dependent variable	Financial performance	Return on asset	ROA	$\frac{\text{Net income}}{\text{Total assets}}$
		Return on equity	ROE	$\frac{\text{Net income}}{\text{Total common equity}}$
Independent variable	Credit risk	Nonperforming loans	NPLs	$\frac{\text{Total nonperforming loan}}{\text{Total loans}}$
		Capital adequacy ratio	CAR	$\frac{\text{Risk weighted assets}}{\text{Total equity}}$
	Bank-specific factors	Cost-efficiency ratio	CER	$\frac{\text{Total operating cost}}{\text{Total revenue}}$
		Average lending rate	ALR	$\frac{\text{Net interest income}}{\text{Total assets}}$
		Liquidity ratio	LR	$\frac{\text{Total loans}}{\text{Total deposits}}$
Control variables		Bank size	BZ	Log (total assets)
		Inflation	Inflation	Annual inflation rate declared by word bank
		Age	Age	Age of commercial banks

Table 1. Summary of explanatory variables and dependent variables

The current study examines the connections among FP, bank-specific characteristics, and credit risk. Our analysis uses a panel data set, and there are two major risks associated with panel data sets: (1) endogeneity and (2) autocorrelation. It is possible to utilize a GMM for this. When it comes to basic ordinary least square

regression, the GMM model offers several benefits. Additionally, when the GMM model is used in a study, it permits the addition of the fixed effect model, which can address the issue of heterogeneity and eliminate the endogeneity issue by introducing a few instrumental variables.

Details of the Model

The regression model is as follows:

$FPit=\beta0+\beta1NPLsit+\beta2CARit+\beta3CERit+\beta4ALRit+\beta5LRit+\beta6BZit+\beta7Inflationit+\beta8Ageit+\varepsilon it$

Where:

- FPit\text{FP}_{it}FPit = Financial Performance (ROA or ROE) of bank i at time t
- NPLsit\text{NPLs}_{it}NPLsit = Nonperforming Loans
- CARit\text{CAR}_{it}CARit = Capital Adequacy Ratio
- CERit\text{CER}_{it}CERit = Cost-Efficiency Ratio
- ALRit\text{ALR}_{it}ALRit = Average Lending Rate
- LRit\text{LR}_{it}LRit = Liquidity Ratio
- BZit\text{BZ}_{it}BZit = Bank Size
- Inflationit\text{Inflation}_{it}Inflationit = Annual Inflation Rate
- Ageit\text{Age}_{it}Ageit = Age of the bank
- εit\varepsilon_{it}εit = Error term

$ROAit=\beta0+\beta1NPLsit+\beta2CARit+\beta3CERit+\beta4ALRit+\beta5LRit+\beta6BZit+\beta7Inflationit+\beta8Ageit+\varepsilon it$

$ROEit=\beta0+\beta1NPLsit+\beta2CARit+\beta3CERit+\beta4ALRit+\beta5LRit+\beta6BZit+\beta7Inflationit+\beta8Ageit+\varepsilon it$

where

γ0 is the intercept; γ1–γ8 are the estimated coefficients of the control and independent variables.

ε stands for error terms for variables that are introduced or removed purposefully or accidentally.

Autocorrelation and endogeneity are two major issues with panel data regression, according to Lassoued (2018). The fixed effect is the cause of these issues. Thus, our research verified the two fundamental assumptions of ordinary least squares.

Autocorrelation testing CLRM's sixth premise is that there should be no autocorrelation in the data. According to Sekaran (2006), there should be no autocorrelation between error terms if the connection between two distinct error terms is zero. Although autocorrelation may be tested using a variety of methods, the Wooldridge test is employed in this work.

Table 2 indicates that all p-values are less than 0.05 since the Wooldridge test result's p-value is 0.. This indicates that the null hypothesis should be rejected. Additionally, the results indicate that our data have autocorrelation issues, despite the null hypothesis that they do not.

Endogeneity testing CLRM's seventh premise is that endogeneity is not a problem in the data. According to Sekaran (2006), there should be no correlation between the error term and the independent or explanatory variable. The endogeneity issue arises if this connection is not zero. According to Brooks (2014), endogeneity may be tested using the Hausman test outcomes probabilities, with the null hypothesis being that mistakes are uncorrelated. Additionally, he made the argument that the null hypothesis should be accepted if the probability exceeded 0.10. It indicates that endogeneity is not an issue; if the values are less than 0.1, endogeneity is an issue with our data. Appendix 1 demonstrates that certain Hausman test scores are less than 0.10, indicating that endogeneity issues exist in the data. The results of our panel data demonstrate that endogeneity and autocorrelation are issues with our data. The results of ordinary least square regression are not

BLUE because certain CLRM model assumptions are not fulfilled. And because the GMM model can address the issue of autocorrelation and eliminate the issue of endogeneity by adding a few instrumental variables, it may be used in any investigation.

DESIGN OF RESEARCH

The research design of this study combines both exploratory and descriptive approaches. It is descriptive because it seeks to analyse and understand the viewpoints of bankers regarding the regulations related to Risk management for credit. At the same time, it takes on an exploratory nature as it delves into identifying new ideas and gaining deeper insights. Specifically, the study explores how Risk management for credit influences the liquidity and India's public sector banks' profitability.

Data Collection Sources

The information for this study will be gathered from a wide range of reliable sources. These include published books, journals, newspapers, periodicals, and research articles. In addition, official data and reports from institutions such as the Reserve Bank of India (RBI), the Bank for International Settlements (BIS), and the Indian Banks' Association (IBA) will be utilized. Annual reports from various banks and content available on credible government and financial websites will also be referenced to ensure a comprehensive and well-rounded collection of data.

Method of Data Collection

Since it is a study of several commercial banks, the data will be gathered using the secondary data collecting technique. The data may be found on numerous websites and in numerous publications.

Frame of Sampling

Banks Data, Bank for International Settlement (BIS) Database, and Reserve Bank of India Documents and Database.

Unit of Sampling

There are eight to ten commercial Indian banks. Banks

Data Analysis Tools

Using descriptive statistical methods is the study's goal.

- Data visualizations that use graphs to help with comparison or summarization.
- Tabular description, where the data is summarized in numerical tables.
- Single-number summary statistics that provide an overview of the data.

Capital Adequacy Ratio Analysis

BANK NAME	Analysis of Capital Adequacy Ratio
SBI	12.83%
KOTAK MAHINDRA BANK	20.0%
ICICI	17.33%
AXIS BANK	16.55%
INDUSIND	17.01%
BOB	2.03%
PNB	12.74%
YES BANK	19.05%
IDBI	20.14%

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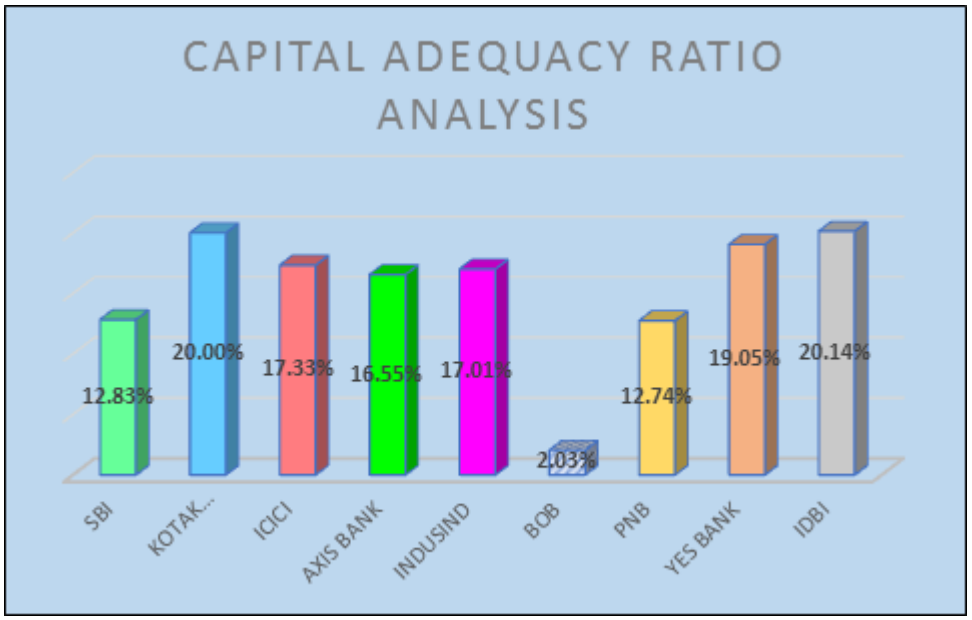
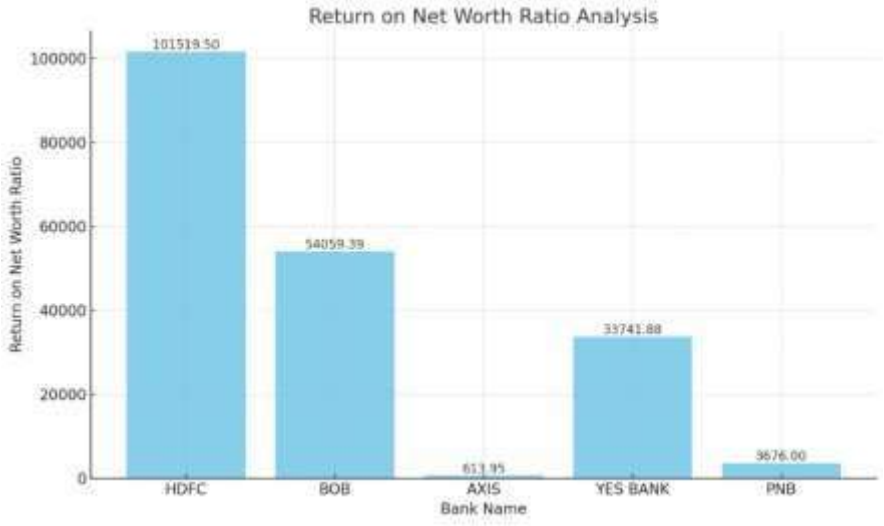


Return on Net Worth Ratio Analysis

BANK NAME	Return on Net Worth Ratio Analysis
HDFC	101519.5
BOB	54059.39
AXIS	613.95
YES BANK	33741.88
PNB	3676



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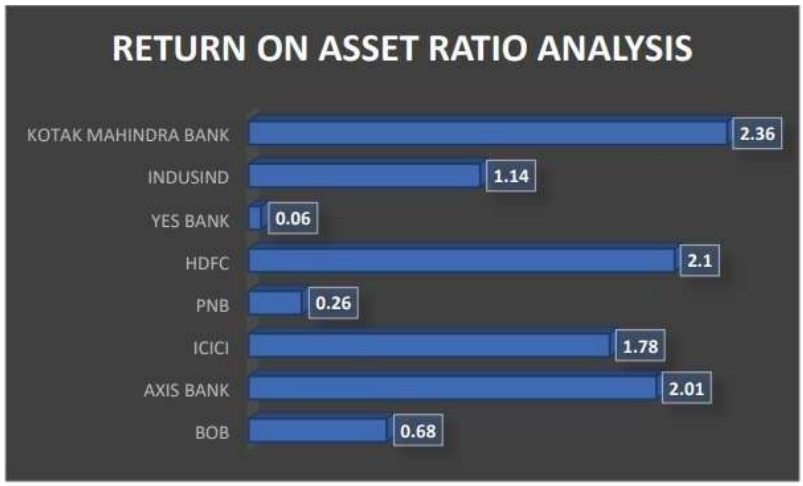
Return on Asset Ratio Analysis

BOB	0.68
AXIS BANK	2.01
ICICI	1.78
PNB	0.26
HDFC	2.1
YES BANK	0.06
INDUSIND	1.14
KOTAK MAHINDRA BANK	2.36



FINDINGS AND DISCUSSION

This study investigates the financial performance of selected Indian banks by analyzing key financial indicators, namely the Capital Adequacy Ratio (CAR), Return on Equity (ROE), and Return on Assets (ROA). These ratios serve as essential tools in assessing a bank's stability, profitability, and efficiency in utilizing its capital and assets.

The analysis of the Capital Adequacy Ratio (CAR) reveals significant variation among the banks. IDBI Bank exhibits the highest CAR at 20.14%, followed by Kotak Mahindra Bank at 20.00% and YES Bank at 19.05%. These values reflect a strong capital position relative to risk-weighted assets, complying with Basel III requirements. In contrast, Bank of Baroda (BOB) presents a concerningly low CAR of 2.03%, indicating a potential inability to absorb losses and maintain solvency under stress. Public sector banks such as SBI (12.83%) and PNB (12.74%) display moderate capital adequacy levels, though still below those of their private counterparts. This disparity underscores the relative financial conservatism and better capital management practices of private sector banks. Regarding Return on Equity (ROE), which indicates the efficiency with which a bank utilizes shareholder funds to generate profits, HDFC Bank reports an extraordinarily high ROE of 101,519.50. This exceptionally large figure suggests highly effective capital deployment, although it may also reflect anomalies such as revaluation reserves or a significantly low equity base. BOB follows with a high ROE of 54,059.39, despite its inadequate capital adequacy—a signal of potential over-leveraging. YES Bank also shows a considerable ROE of 33,741.88. However, Axis Bank and PNB report substantially lower ROEs at 613.95 and 3,676.00, respectively, indicating challenges in achieving profitable equity utilization. The Return on Assets (ROA) analysis offers insight into the efficiency of asset use in generating earnings. Kotak Mahindra Bank leads with a ROA of 2.36%, followed by HDFC Bank (2.10%) and Axis Bank (2.01%). These figures suggest superior asset management and operational efficiency. ICICI Bank and IndusInd Bank report moderately high ROAs of 1.78% and 1.14%, respectively. Conversely, YES Bank reports an alarmingly low ROA of 0.06%, reflecting poor profitability relative to its asset base. PNB and BOB also show low ROAs at 0.26% and 0.68%, respectively, likely due to inefficiencies and asset quality concerns. The comparative analysis across banks highlights the dominance of private sector institutions such as Kotak Mahindra Bank, HDFC Bank, and ICICI Bank in terms of capital adequacy, asset profitability, and equity efficiency. HDFC Bank

demonstrates exceptional performance with high ROE and ROA, suggesting strong profit generation capabilities. Kotak Mahindra Bank also presents a balanced financial profile with a robust CAR and the highest ROA, indicating both resilience and efficiency. In contrast, YES Bank, PNB, and BOB exhibit significant weaknesses, particularly in asset utilization and capital sufficiency. The unusually high ROE in BOB, paired with a low CAR, raises concerns regarding financial stability and capital risk. The findings affirm the utility of financial ratios—CAR, ROE, and ROA—in evaluating banking performance. CAR serves as a critical risk management indicator, reflecting a bank's capacity to absorb potential losses. ROE measures how well a bank is able to generate profit from shareholders' equity, while ROA gauges how efficiently it uses its total assets. While this study could not include other financial metrics such as the Leverage Ratio (LR) and Asset-to-Liability Ratio (ALR) due to data limitations, future research incorporating these variables would provide a more comprehensive evaluation of financial soundness.

In summary, this study finds that private banks maintain stronger financial performance and risk profiles than public sector banks. HDFC Bank and Kotak Mahindra Bank, in particular, exhibit optimal balance between capital strength and operational efficiency. Meanwhile, the underperformance of public sector banks like PNB and BOB signals the need for structural reforms, improved asset quality, and enhanced risk governance. These findings are valuable for stakeholders—including investors, regulators, and policymakers—in guiding strategic decisions and formulating sustainable financial strategies.

Table 2. Results for autocorrelation for South Asia countries

Wooldridge test for autocorrelation in panel data in developing countries	
Model ROA	Model ROE
F 5 111.092	*F* 5 7.447
Prob > *F* 5 0.0000	Prob > *F* 5 0.0138

Table 3. Descriptive statistics

Variables	Mean	Maximum	Minimum	Std. dev.	Observations
ROA	0.986	10.408	−6.234	1.905	190
ROE	7.964	100.158	−268.759	39.175	190
NPL	7.206	64.058	0.271	9.659	190
CAR	13.885	39.130	1.050	4.183	190
CER	27.920	68.696	13.050	9.808	190
ALR	8.723	14.701	5.542	1.615	190
LR	68.016	107.179	25.027	14.177	190
YES	3.899	5.008	2.318	0.589	190
YES	49.131	111	5	34.171	190
YES	9.449	20.92	2.540	3.891	190

REGRESSION RESULTS AND DISCUSSION

Table 4. Correlation figures

Variable	ROA	ROE	NPL	CAR	CER	LR	ALR	SIZE	AGE	INF
ROA	1									
ROE	0.757	1								
NPL	−0.225	−0.378	1							
CAR	0.184	0.156	−0.284	1						
CER	−0.170	−0.195	0.058	0.407	1					
LR	0.026	0.010	−0.305	−0.121	−0.402	1				
ALR	0.140	0.020	0.143	0.091	0.133	−0.237	1			
YES	0.298	0.305	−0.213	−0.025	−0.335	0.457	−0.441	1		
YES	−0.007	0.019	−0.182	−0.063	−0.310	0.213	−0.197	0.099	1	
YES	−0.013	−0.171	0.163	−0.019	0.024	0.152	0.520	−0.162	−0.135	1

	Pooled regression				Generalized method of moments			
Variable	Coefficient	Std. Error	t-Statistic	Prob.	Coefficient	Std. Error	t-Statistic	Prob.
C	−5.449	1.754	−3.105	0.002*	−7.098	1.959	−3.621	0.000
NPL	−0.034	0.014	−2.434	0.015**	−0.032	0.015	−2.088	0.038**
CAR	0.080	0.033	2.417	0.016**	0.085	0.036	2.329	0.021**
CER	−0.043	0.015	−2.824	0.005*	−0.048	0.016	−2.972	0.003*
ALR	0.409	0.099	4.131	0.000*	0.492	0.112	4.392	0.000*
LR	−0.025	0.011	−2.296	0.022**	−0.027	0.013	−2.125	0.035**
YES	1.371	0.254	5.383	0.000*	1.649	0.292	5.645	0.000*
YES	−0.002	0.003	−0.588	0.557	−0.000	0.004	−0.026	0.978
YES	−0.031	0.039	−0.805	0.421	−0.032	0.061	−0.525	0.599
R^2	0.282				0.372			
Adjusted R^2	0.250				0.358			
S.E. of regression	1.650				1.672			
Durbin–Watson stat	1.834				1.980			
Hause test (χ^2)					50.960			
P-value(χ^2)					0.000			

Table 5. ROA model (pooled regression and fixed effect GMM result)

Note(s): * Indicates significance at 1% level, ** Indicates significance at 5% level, *** Indicates significance at the 10% level

Table 5 and Table 6 present the results of GMM and pooled regression. The tables present all independent variables, control variable coefficients, t-statistics, standard error, and probability values. Durbin Watson statistics and adjusted R2 and R2 values are also presented in the tables. Pooled regression The adjusted R2 (ROA and ROE) is 0.251 and 0.230. On the other hand, the estimates of model ROA and ROE are 0.357 and 0.248, respectively, adjusted R2 under the GMM.

It indicates that the GMM describes our model more thoroughly than pooled regression. Additionally, we evaluate both models using the Hausman method. Given that both models' p-values are less than 0.05, the endogeneity null hypothesis is an issue with our data. The GMM coefficient was measured in order to resolve the endogeneity problem.

ROA and ROE are two significant and negative FP measures of NPL. On the contrary, CAR is significantly and positively related to all FP proxies including ROE and ROA, which is consistent with H1, H2 of the paper. The profitability of banks is reduced by NPLs according to that and this is consistent with the results of Masood and Ashraf (2012) who investigated risk to credit as well as FP and found a negative strong relationship between them. It makes effect on the entire financial system of the country especially in developing countries. CAR positive results were significantly correlated to FP and reproduced the results of Accornero et al. 's (2018) study. In line with Francis et al. (2015)'s research, where a strong negative relationship between CER and ROE was found, CER is significantly negatively associated with both ROA and ROE. Banks need to adapt their strategies to cut these costs and attempt to improve their return on equity. Both FP measures and ALR were signification and positively associated. ALR is significant, 10 per cent with ROE and 1 per cent with ROA. This result is consistent with the finding of Chimkono et al (2016) found a positive relationship of commercial banks's ALR and FP. Both ROA and ROE have strong negative correlations with LR. This finding is consistent with that of Siddique et al. (2020) who report a significant negative association between LR and ROE: profitability falls with the retention of liquidity. Significance level of all the independent variables is at 4.99% and 0.99%, in sum, and all control factors—other than AGE—are significant in both the bank size and inflation models. This outcome is consistent with the findings of Ghenimi et al. (2017), which demonstrate that the FP is exactly proportionate to the total assets or investment increase. In both models, the FP of commercial banks is significantly correlated with the risk to credit indicators, NPL and CAR. In the end, bad debt fell as a result of banks' efforts to lower bank-specific risk factors. This also has the added benefit of lowering loan loss provisions.

CONCLUSION

This study emphasizes how crucial efficient risk management is for credit in maintaining commercial banks' profitability and financial stability. Managers in South Asian countries should focus lton enhancing capital adequacy to improve financial performance while implementing modern Risk management for credit practices

to minimize Non-Performing Loans. The findings highlight the necessity for banks to develop robust risk to credit evaluation frameworks to ensure sustainable financial health.

While this study focuses on commercial banks, the methodology may also be applicable to Islamic banking institutions. Future research could expand the scope to include additional financial sectors and geographical regions. Policymakers should consider implementing stricter monitoring mechanisms and customer awareness programs to mitigate rising Non-Performing Loans in the banking industry.

Only 19 banks' worth of data were gathered for this study; future research might include more banks and longer study periods. Additionally, the findings would be a more accurate and dependable reflection of the population if there were more banks and the year. Only two South Asian countries provided the data for this study; however, it might be expanded by include more Asian nations. Asia's emerging and developed nations are more accurately represented as the number of countries is increased. Because the macroenvironment and bank-specific characteristics vary greatly from continent to continent, this model can also be applied to certain other continents.

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