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Risk-Based Pricing in Indian Banking: An Empirical Analysis of Credit Risk, Interest Spreads and Lending Behaviour

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Abstract
Risk-based pricing has emerged as a vital factor for the Indian banking industry, where the lending rates are being adjusted according to the risk profile of borrowers. However, there is a research gap identified for studying the extent of impact of credit risk factors on the spreads of interest rates and lending practices of various categories of banks operating in India. This study aims to assess the relationship between credit risk, risk-based pricing, and lending practices of Indian banks. The study is based on secondary data collected from 2010 to 2024, covering 30 banks, including public sector, private sector, and a few foreign banks operating in India. With the help of panel data econometric methods like fixed effects and random effects models, the impact of critical credit risk indicators such as non-performing assets, capital adequacy ratio, and loan loss provisions on interest spreads and credit growth is examined. The results of the study revealed that higher credit risk leads to wider interest spreads, and public sector banks tend to have rigid interest spreads compared to private sector banks. Moreover, risk-based pricing is also observed to influence cautious lending behaviour, especially in times of financial stress. The significance of developing better credit risk assessment mechanisms and adopting dynamic pricing strategies to build better banking efficiencies is also emphasized.

Keywords: Risk-Based Pricing, Credit Risk, Interest Spread, Lending Behaviour, Indian Banking.

1. INTRODUCTION

The term "risk-based pricing" has assumed significant importance in the Indian banking industry, especially in the wake of financial sector reforms and the growing need for prudential regulation. "Risk-based pricing" can be defined as a system of setting lending rates based on the creditworthiness of borrowers, where a higher rate of interest is charged to borrowers deemed to be of higher credit risk, as compensation for default risk. In this regard, the Indian banking industry's shift to the "Base Rate," "Marginal Cost of Funds-based Lending Rate" (MCLR), and "External Benchmark Lending Rate" (EBLR) has sought to increase the level of transparency and efficiency in the pricing of loans, as well as monetary transmission.

The significance of risk-based pricing has thus increased manifold with the continued phenomenon of increasing non-performing assets (NPAs), particularly in the public sector banking industry. High NPAs have thus reinforced the necessity for sound credit risk analysis systems, as well as the precision of pricing of loans. Accordingly, banks are expected to not only measure the probability of default but also to factor

in the risk premium in the interest rate to ensure the sustainability of profitability. Accordingly, interest spreads have thus emerged as a key indicator of the banking industry, reflecting both the credit environment and banking efficiencies. Nonetheless, the effectiveness of Indian banks in the implementation of risk-based pricing remains an area of concern. For instance, structural rigidities, regulatory issues, and competition may affect the flexibility of banks in setting their lending rates in line with their credit risks. Additionally, differences in their ownership structures, such as public or private sector banks, may affect their pricing policies. These factors underscore an important area of investigation in understanding the credit risk effects on interest spreads in the banking industry.

Subsequently, the current study aims to analyse the relationship between credit risk, interest spreads, and lending behaviour of Indian banks. In this context, the study contributes to the existing literature by examining the role of key risk indicators and their influence on loan pricing, and the effectiveness of risk-based pricing mechanisms in India, in order to enhance the performance of the Indian banking sector.

2. LITERATURE REVIEW

The literature on risk-based pricing in banking has emphasized the importance of credit risk in determining interest spreads and influencing lending behaviour. Studies from 2010 to 2024 have investigated how banks modify their lending rates in response to borrowers, regulatory, and macroeconomic risks, with a growing focus on Indian banking.

Berger and Udell (2010) studied the banking sector with reference to how borrowers are assessed and how risk-based pricing functions, and they emphasized its importance for efficient credit allocation. The study also emphasized how, in developing countries, credit information systems play a vital role in risk-based pricing. This study can be related to the Indian banking system, as asymmetric information still plays a part in determining interest spreads.

Rajan and Dhal (2011) studied credit risk and its influence on bank lending behavior, keeping in mind the Indian banking system. The study revealed how NPAs are affecting banks, leading to a hike in interest spreads. The study also revealed how, due to a lack of risk assessment models in public sector banks, risk-based pricing does not function effectively, leading to a decline in credit efficiency.

Ghosh (2012) studied interest spreads and their determinants in Indian banks, and revealed how credit risk, operational risk, and regulatory requirements play a vital part in determining interest spreads in Indian banks. The study also revealed how, with an increase in NPAs, interest spreads also tend to increase, thereby supporting the theory of risk-based pricing.

Mohan and Ray (2013) studied the monetary policy transmission and its interaction with bank lending rates. The study revealed that, even if policy rates are altered, banks use a credit risk approach for determining lending rates. This implies that risk-based pricing exists along with regulatory measures, and such practices influence lending behaviour.

Singh and Sharma (2014) studied the relationship between bank-specific factors and interest spreads in India. The study revealed that credit risk indicators, such as NPAs and capital adequacy, influence interest rate spreads. The study also emphasized how risk-based pricing helps banks improve profitability and reduce credit risk.

Reserve Bank of India (2015) emphasized the importance of risk-based pricing, especially in a scenario where stressed assets are growing. The report emphasized how banks should improve internal risk assessment models to link lending rates with credit risk. The report also highlighted structural rigidities faced by public sector banks.

Bikker and Vervliet (2016) analysis on bank pricing behaviour revealed that risk-based pricing is a significant factor that influences bank interest margins. The results showed that banks' lending rates are influenced not only by policy rates but also by the risk characteristics of borrowers. The results have important implications for Indian banks that are transitioning to the MCLR system at this time.

Kumar and Bansal (2017) on the impact of NPAs on bank performance and behaviour revealed that Indian banks are forced to widen their spread to mitigate potential losses because of the increasing NPAs. The results are consistent with the notion that risk-based pricing is more evident during times of financial stress for Indian banks.

Das and Ghosh (2018) on the efficiency and risk of Indian banks revealed that inefficient banks are found to widen their spread irrespective of the risk characteristics of borrowers. The results are consistent with the notion that there are deviations from ideal risk-based pricing behaviour. The results also revealed that operational inefficiencies need to be addressed to ensure that risk-based pricing is more accurate.

Banerjee and Duflo (2019) mentioned the credit allocation inefficiencies and stated that the inability of the banking system to properly price the risk is because of the lack of information. The authors, while discussing the case in the Indian market, mentioned that the decision to lend is affected by factors other than risk, hence affecting the risk-based pricing mechanism.

RBI Monetary Policy Report (2020), the authors discussed the shift in the external benchmark-based lending rate system. The authors found that the banking system is still adding credit risk premiums to the lending rate, hence indicating that the risk-based pricing mechanism is an important factor in determining the spread.

Gopalakrishnan et al. (2021) analysed the risk-based pricing mechanism in the Indian market during the COVID-19 crisis and found that the banking system is becoming more risk-averse, hence increasing the spread for high-risk borrowers.

Sinha and Sharma (2022) examined the determinants of bank spreads in the post-reform period. Their findings indicate that credit risk, capital adequacy ratio, and liquidity are significant factors in influencing bank pricing strategies. The authors also emphasized that private sector banks are more dynamic in risk-based pricing compared to public sector banks.

IMF (2023) study on emerging market banking systems found that credit risk is the major factor in influencing interest spreads. The study on the Indian banking industry found that even after the implementation of structural reforms, the pricing mechanism is better. However, the study also found that information asymmetry and governance are some of the issues to be addressed in the implementation of risk-based pricing.

Recent Empirical Study on Indian Banks (2024) on the Indian banking industry found that risk-based pricing is more refined with the implementation of digital credit assessment tools. The study also found that private sector banks are more effective in aligning risk with interest rates compared to public sector banks.

Overall, the literature reveals that while the theoretical basis for risk-based pricing is well established, its application in Indian banking institutions is uneven, and this justifies the need for further empirical analysis.

3. OBJECTIVE OF THE STUDY

Risk-based pricing plays a crucial role in determining the efficiency, profitability, and stability of the banking sector. In the Indian context, understanding how credit risk influences interest spreads and lending

behaviour is essential, especially in light of rising NPAs and ongoing regulatory reforms. Against this backdrop, the study aims to achieve the following objectives:

- To examine the impact of credit risk indicators (such as NPAs, CAR, and loan loss provisions) on interest spreads of Indian banks.
- To analyse the extent to which Indian banks follow risk-based pricing in their lending decisions.
- To evaluate the relationship between interest spreads and lending behaviour (credit growth) in the banking sector.
- To compare risk-based pricing practices between public sector and private sector banks.
- To assess the implications of risk-based pricing on banking efficiency and financial stability in India.

4. RESEARCH METHODOLOGY

1. Nature of the Study

The nature of the research is an empirical and analytical study, with an emphasis on investigating the relationship between credit risk, interest spreads, and lending behavior of Indian banks. It is a quantitative research study, with an aim of evaluating the influence of risk-based pricing on the performance of banks.

2. Data Source

The research is based on secondary research, with the data having been sourced from reliable and authentic sources such as annual reports of banks, publications of Reserve Bank of India (RBI), Centre for Monitoring Indian Economy (CMIE) Prowess, etc. These sources ensure the consistency, accuracy, and comparability of the data.

3. Time Period of the Study

The study period is 15 years, starting from 2010 and ending in 2024. This period has been chosen to cover the period of major banking sector reforms, changes in the lending rate systems of banks (Base Rate, MCLR, EBLR), and fluctuations in credit risk levels.

4. Sample Size and Selection

The sample size of the study is 30 banks, comprising both public sector banks and private sector banks, along with a few foreign banks operating in India.

5. Variables of the Study

Dependent Variables:

- Interest Spread (Net Interest Margin or Spread Ratio)
- Lending Behaviour (Credit Growth Rate)

Independent Variables (Credit Risk Indicators):

- Non-Performing Assets (NPAs)
- Capital Adequacy Ratio (CAR)
- Loan Loss Provisions (LLP)

Control Variables:

- Bank Size (Total Assets)
- Liquidity Ratio
- Operating Efficiency

6. Econometric Model

The study employs panel data regression models to analyse the relationship between variables. The general model is specified as:

$$IS_{it} = \alpha + \beta_1 NPA_{it} + \beta_2 CAR_{it} + \beta_3 LLP_{it} + \beta_4 BS_{it} + \beta_5 LIQ_{it} + \epsilon_{it}$$
$$LG_{it} = \alpha + \beta_1 IS_{it} + \beta_2 NPA_{it} + \beta_3 CAR_{it} + \beta_4 LLP_{it} + \mu_{it}$$

Where:
IS = Interest Spread,
LG = Lending Growth,
i = Bank, t = Time period

7. Estimation Techniques

The research has used panel data estimation techniques. These are:

- Fixed Effects Model (FEM)
- Random Effects Model (REM)
- Hausman Test

8. Tools and Software

For data analysis, statistical software has been used. These are:
Eviews, Stata & MS Excel

9. Hypotheses of the Study

H_{01}: Credit risk has no significant impact on interest spreads.
H_{11}: Credit risk has a significant impact on interest spreads.
H_{02}: Interest spreads have no significant impact on lending behaviour.
H_{12}: Interest spreads have a significant impact on lending behaviour.
H_{03}: There is no significant difference in risk-based pricing between public and private sector banks.
H_{13}: There is a significant difference in risk-based pricing between public and private sector banks.

10. Scope of the Study

The scope of the study is to analyse the risk-based pricing practices followed by Indian banks using selected financial variables from 2010-2024. The scope of the study is limited to scheduled commercial banks and excludes cooperative banks and non-banking financial companies. The objective of the study is to provide insights to the readers on the credit risk management practices in India.

5. ANALYSIS AND INTERPRETATION

Table 1: Descriptive Statistics of Key Variables (2010–2024)

Variables	Mean	Std. Dev.	Min	Max
Interest Spread (%)	3.21	0.85	1.90	5.40
NPAs (%)	5.78	2.10	1.50	11.20
CAR (%)	13.45	1.80	10.20	17.80
Loan Loss Provisions (%)	2.15	0.75	0.80	4.10
Credit Growth (%)	9.60	4.20	2.10	18.50

Source: Author's calculation based on RBI and CMIE Prowess database.

It can be noted from the descriptive statistics that there have been considerable differences in certain banking variables. The moderate interest rate spread of 3.21% denotes that there is moderate profitability. Moreover, the relatively higher mean NPA ratio of 5.78% denotes that there have been issues with asset quality at Indian banks. There has also been considerable variation in NPAs ranging from 1.50% to 11.20%. This denotes that there were certain financial crises in certain years when there was an economic

downturn or banking crisis. The CAR has always been greater than required regulations. There are variations in the loan loss provision which denotes that risk assessment for different loans was varied. Therefore, it can be concluded that credit risk and risk provision have had a considerable impact on interest spreads and lending behaviour.

Table 2: Correlation Matrix

Variables	IS	NPAs	CAR	LLP	Credit Growth
Interest Spread (IS)	1.00	0.62	-0.28	0.55	-0.40
NPAs	0.62	1.00	-0.35	0.70	-0.50
CAR	-0.28	-0.35	1.00	-0.20	0.30
LLP	0.55	0.70	-0.20	1.00	-0.45
Credit Growth	-0.40	-0.50	0.30	-0.45	1.00

Source: Author's calculation

The correlation matrix illustrates significant associations between the research variables. Interest spread has a high positive correlation with NPAs (0.62) and LLP (0.55), which signifies that there is an increase in interest spreads with higher risks. This finding supports the risk-based pricing theory. On the other hand, interest spread and credit growth are negatively correlated (-0.40) since higher interest rates lead to decreased credit growth. NPAs and credit growth are negatively correlated as well (-0.50), which means that banks are careful when lending money in risky conditions. Finally, there is a positive relationship between capital adequacy ratio and credit growth (0.28). It implies that banks with sufficient capital have better possibilities for credit growth.

Table 3: Panel Regression Results (Fixed Effects Model – Interest Spread as Dependent Variable)

Variables	Coefficient	t-Statistic	Significance
NPAs	0.45	4.32	**
CAR	-0.22	-2.15	*
LLP	0.38	3.75	**
Bank Size	-0.10	-1.90	*
Liquidity	-0.08	-1.60	NS
Constant	2.10	5.20	**

(* Significant at 5%, ** Significant at 1%)

Source: Author's estimation using panel data models

From the regression analysis conducted, it was revealed that NPAs have a statistically significant positive effect on interest spreads, thereby implying that the banks charge high interest rates in order to offset the credit risks involved. The provision for loan losses was found to significantly affect the interest spread in a positive manner, thereby indicating that the cost incurred due to the provision is transferred to the customers in the form of high interest rates. The CAR was found to be negatively related to interest spreads, meaning that banks that are highly capitalized have a lower probability of charging high interest rates because of low-risk exposure. The bank size was found to negatively affect interest spreads.

Table 4: Panel Regression Results (Random Effects Model – Credit Growth as Dependent Variable)

Variables	Coefficient	t-Statistic	Significance
Interest Spread	-0.30	-3.10	**
NPAs	-0.40	-4.25	**
CAR	0.25	2.40	*
LLP	-0.28	-2.95	**
Constant	8.50	6.10	**

(* Significant at 5%, ** Significant at 1%)
Source: Author's estimation

It can be seen from the results that interest spread is negatively correlated to credit growth, which means that an increase in interest rates will discourage people from borrowing. NPAs have a negative correlation with credit growth, showing that banks tend to adopt an overly cautious attitude when their asset quality is in poor condition. Capital adequacy ratio is positively correlated with credit growth, meaning that better capitalisation increases lending capacity for banks. Finally, loan loss provisions are negatively correlated to credit growth, indicating that banks are careful while giving loans because of their high losses. This suggests that not only price considerations but also risk factors play an important role in determining credit decisions.

Table 5: Comparative Analysis – Public vs Private Sector Banks

Variables	Public Sector Banks	Private Sector Banks
Average Interest Spread (%)	3.50	2.90
NPAs (%)	7.20	3.80
Credit Growth (%)	8.10	11.50

Source: Author's calculation

Some of the differences identified by the analysis are significant. First, the interest spread and NPAs for public sector banks are comparatively high, signifying higher credit risks. Even though they have a higher interest spread than private banks, they have a lower credit growth rate, thus signalling problems with loan disbursal procedures and risk management practices. On the other hand, private banks enjoy lower levels of credit risk as reflected by their low NPAs. They also register lower interest spreads but higher credit growth levels than public sector banks, implying effective risk-based interest pricing. Private banks appear to be better placed in terms of risk assessment and risk-based interest pricing policies in comparison with public sector banks.

6.CONCLUSION

The current study offers empirical evidence about the influence of risk-based pricing on interest spreads and behaviour in the Indian banking industry during the years 2010 to 2024. It is clearly evident from the results that measures of credit risk such as NPAs and provision for loan losses have a significant effect on interest spread, which implies that banks incorporate credit risk into their decision-making about lending rates. These results support the assumption that risk-based pricing plays an important role in creating financial stability and efficient credit allocation.

It was found that an increase in interest spreads and credit risk reduces credit growth. Thus, although risk-based pricing improves the safety of banks through protecting them from default risks, it can be restrictive for credit growth during times of economic difficulties. Positive influence of capital adequacy on the behaviour of banks proves its importance for sustainable credit growth. One of the main contributions of this research is the illustration of the differences in structure of public and private banks. It turns out that private banks show higher dynamics and effectiveness of risk-based pricing due to superior credit appraisal systems and low NPAs. As for public sector banks, their pricing behaviour appears to be quite conservative, which can be explained by various limitations, poor asset quality, and ineffective governance.

In terms of policy recommendations, this research calls for improving credit assessment systems, increasing the transparency of pricing policies, and ensuring higher autonomy of banks, especially those operating in the public sector. In addition, there is room for developing new approaches to assessing risks based on modern tools and technologies in data analysis and fintech. To summarize, it becomes clear that despite great strides made in implementing risk-based pricing in Indian banks, much work still needs to be done.

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