

A Study on the Impact of Financial Technology on Market Risk Management of Indian Banks

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Abstract: Financial Technology (FinTech) has emerged as a revolutionary technology within the banking industry, leading to higher efficiencies, innovations, and improved risk management practices. This study seeks to investigate the effect of FinTech on market risk management of Indian banks focusing especially on the risks associated with changes in interest rates and foreign exchange rates. Furthermore, this study will highlight how FinTech technology facilitates real-time data processing, helps in identifying and monitoring risks, and contributes to decision making within the bank. Data collection for this study has been done using a secondary source which includes annual reports from selected Indian banks, Reserve Bank of India (RBI) reports, scholarly journals, articles and other financial databases. Methods of analysis and description have been used to conduct an evaluation of market risk management both prior to and post adoption of FinTech technology. Some important parameters considered in this study include Value at Risk (VaR) ratios, Capital Adequacy Ratios (CAR), increase in digital transactions, and FinTech technology adoption. The results of the research show that FinTech can be very useful in enhancing market risk management because of the real-time monitoring, predictive analytics, and risk assessment. It was concluded that FinTech has a positive effect on increasing the efficiency of operations, risk reduction, and stability in the banking industry. Nevertheless, it should be recognized that cybersecurity, regulation, and privacy of personal information continue to be crucial problems.

Keywords: Fintech, market risk, Indian banks, risk management,

1. INTRODUCTION

Banking is an integral part of the finance sector and is a driving force behind economic growth and stability. Today, the rapid developments in technology have completely revolutionized traditional banking practices, which have paved the way for the advent of FinTech. The widespread application of FinTech has drastically influenced the way banks approach risk management and transaction processing.

Market risk, or financial risk, is among the principal threats that banks face due to changes in interest and foreign exchange rates. Traditionally, risk management was based on historical data and required extensive manual labour. However, FinTech has enabled banks to adopt innovative analytical tools and real-time risk assessment techniques that enhance the effectiveness of risk management procedures. Over the last few years, the growth of digitalization and regulatory and competitive pressures has led to the expansion of FinTech applications in the Indian banking sector. As a result, a deeper comprehension of the impact of FinTech on market risk management is critical for assessing its contribution to banking efficiency and financial stability.

Statement of the Problem

The market risks faced by Indian banks arise from the variability of interest rates, foreign exchange rates, and the stock market. Despite the use of various FinTech applications like artificial intelligence and big data to mitigate risk management problems, there is no certainty about the effectiveness of such practices. Furthermore, factors like cybersecurity risk and regulatory risks could affect performance. Consequently, this research explores the influence of FinTech on market risk management and the constraints it faces.

Research Objectives

- To compare market risk management practices in Indian banks before and after FinTech adoption.
- To examine the role of FinTech in real-time data processing for effective market risk management.

Significance of the Study

The present study is important as it focuses on the importance of FinTech for the improvement in market risk management practices adopted by the banks in India. Through the present study, both the bankers and policymakers can learn about the importance of adopting new technology for effective identification and monitoring of risk. The present study is timely in today's digital banking era due to the significance of risk management in the banking industry.

Scope and Limitations

This study centres on the analysis of the influence that financial technology (FinTech) has on the management of market risks in selected Indian banks through the use of secondary data sources such as annual reports, Reserve Bank of India publications, and other financial databases.

2. REVIEW OF LITERATURE

i.J. Sharma (2021) – “FinTech Adoption in Banking Sector: An Empirical Study” The study aimed to examine the growth and adoption of Financial Technology in the banking sector and its impact on banking operations. The research used a descriptive methodology based on secondary data collected from banking journals, RBI reports, and annual reports of banks. The study found that FinTech significantly improved digital banking services, operational efficiency, customer satisfaction, and financial accessibility.

ii.P. Guo (2024) – “FinTech Adoption and Bank Risk-Taking: Evidence from China” The objective of the study was to analyse the impact of FinTech adoption on bank risk-taking behaviour. The study used panel data analysis and quantile regression methods on commercial banks. Secondary financial data from banking institutions were collected for the analysis. The findings revealed that FinTech adoption reduced risk exposure and improved financial stability, especially in technologically advanced banks.

iii.M. He (2023) – “FinTech Adoption, Internal Control Quality and Bank Risk Taking” The study aimed to analyse the effect of FinTech adoption on internal control quality and bank risk-taking behaviour. The research used panel data methodology and secondary data collected from commercial banks. The findings revealed that FinTech improves internal control systems, increases transparency, reduces operational, market risks.

3. RESEARCH METHODOLOGY

The Descriptive and analytical research design is used for this study. The Secondary Data is used from the Sources RBI reports and circulars, Annual reports of Indian banks, SEBI and Ministry of Finance publications, Research journals and articles, Websites and financial databases. The Period of Study from 2015 to 2024. The Data Analysis techniques are collected data is analysed using Descriptive Statistics, Comparative Analysis, Graphical Representation. The Statistical Tool are Descriptive Statistics, Compound Annual Growth Rate (CAGR), Correlation Analysis, Trend Analysis, Ratio Analysis

Hypothesis

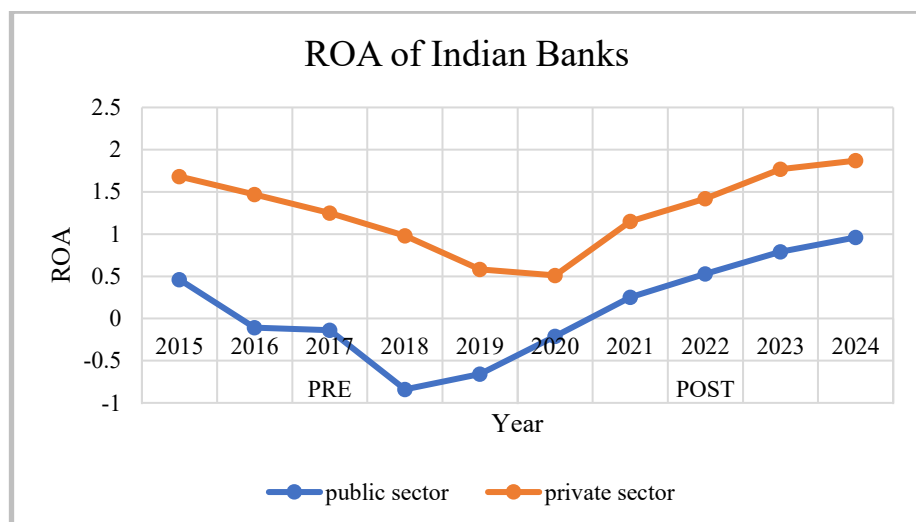
H_0 : FinTech adoption has a significant positive impact on market risk management in Indian banks.

H_1 : Real-time data processing through FinTech significantly improves the monitoring of market risk in Indian banks.

4. DATA ANALYSIS AND INTERPRETATION

ROA

	Year	Public Sector Banks	Private Sector Banks
PRE	2015	0.46	1.68
	2016	-0.11	1.47
	2017	-0.14	1.25
	2018	-0.84	0.98
	2019	-0.66	0.58
POST	2020	-0.21	0.51
	2021	0.25	1.15
	2022	0.53	1.42
	2023	0.79	1.77
	2024	0.96	1.87

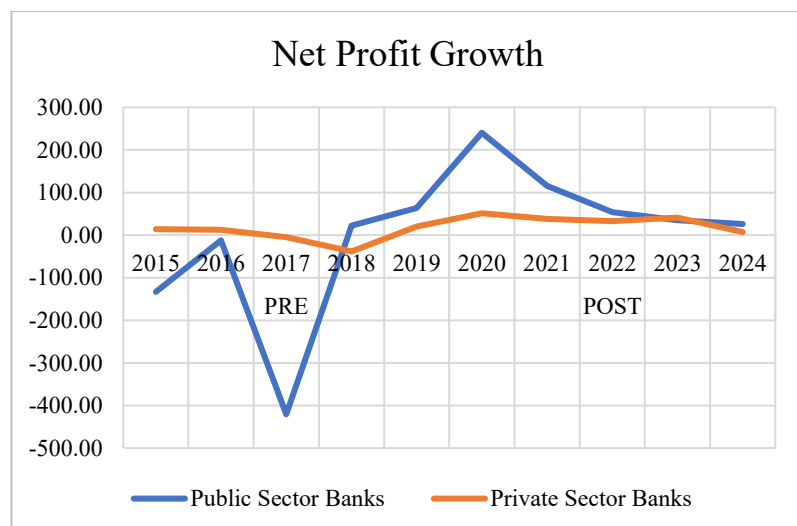


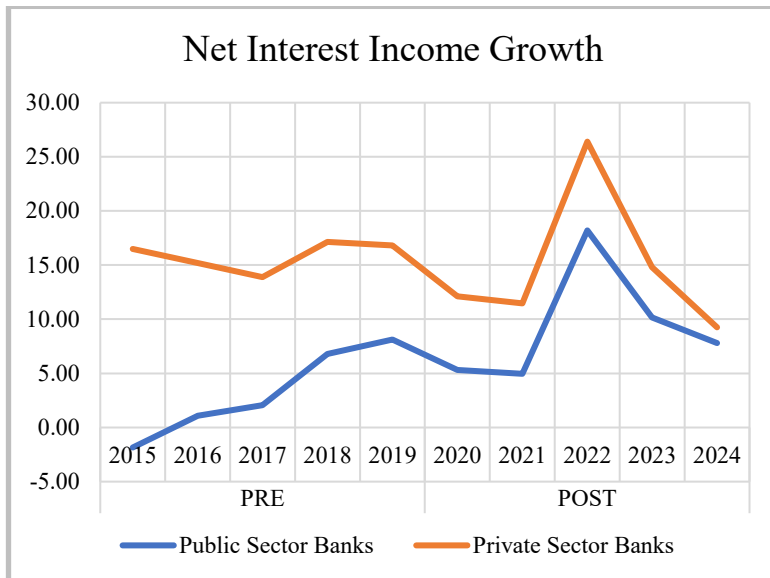
Interpretation:

The analysis contrasts the ROA of public and private sector banks prior to and following FinTech acceptance. The graph shows that both bank groups saw higher earnings in the time after FinTech. While private banks showed consistent growth, public sector banks recovered drastically from negative ROA levels. This enhancement implies FinTech helped to improve risk management and operational efficiency.

Compound Annual Growth Rate (CAGR)

	Year	Net Profit Growth			Net Interest Income Growth		
		Public Sector Banks	Private Banks	Sector	Public Banks	Sector	Private Banks
PRE	2015	-133.50	14.12		-1.85		16.50
	2016	-12.40	12.80		1.10		15.20
	2017	-420.70	-4.60		2.05		13.90
	2018	22.30	-38.40		6.80		17.15
	2019	63.80	20.10		8.12		16.80
POST	2020	240.20	51.30		5.30		12.10
	2021	115.40	38.20		4.95		11.45
	2022	54.10	32.80		18.20		26.40
	2023	35.00	41.00		10.15		14.80
	2024	26.00	7.00		7.80		9.25





Interpretation:

The analysis shows how fast net interest income grew, and the graph stresses the upward trend seen after FinTech was adopted. In the post-FinTech era, both public and private sector banks experienced higher income growth. The graph shows a more consistent and positive trend than in previous years.

Regression Analysis of ROA and Annual UPI Metrics

H_0 : FinTech adoption has a significant positive impact on market risk management in Indian banks.

		ROA		Annual UPI Metrics
	Year	Public Sector Banks	Private Sector Banks	Transaction Volume (in Crore)
PRE	2015	0.46	1.68	0.00
	2016	-0.11	1.47	0.26
	2017	-0.14	1.25	42.00
	2018	-0.84	0.98	375.00
	2019	-0.66	0.58	1079.00
POST	2020	-0.21	0.51	1888.00
	2021	0.25	1.15	3874.00
	2022	0.53	1.42	7404.00
	2023	0.79	1.77	11768.00
	2024	0.96	1.87	17200.00

i. Public Sector Banks (PSBs)

Regression Statistics	
Multiple R	0.774526729
R Square	0.599891653
Adjusted R Square	0.54987811
Standard Error	0.400779236
Observations	10

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	1.92662	1.92662	11.99458	0.00853
Residual	8	1.28499	0.16062		
Total	9	3.21161			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.23625	0.16018	- 1.47490	0.17847	- 0.60562	0.13313	- 0.60562	0.13313
X Variable 1	0.00008	0.00002	3.46332	0.00853	0.00003	0.00013	0.00003	0.00013

ii. Private Sector Banks

Regression Statistics	
Multiple R	0.581222229
R Square	0.33781928
Adjusted R Square	0.25504669
Standard Error	0.406176089
Observations	10

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.67333	0.67333	4.08129	0.07803
Residual	8	1.31983	0.16498		
Total	9	1.99316			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.06744	0.16234	6.57549	0.00017	0.69310	1.44179	0.69310	1.44179
X Variable 1	0.00005	0.00002	2.02022	0.07803	- 0.00001	0.00010	- 0.00001	0.00010

Interpretation:

The statistical study shows a positive relation between FinTech acceptance and market risk management effectiveness in Indian banks. The correlation analysis points out that higher use of digital technology relates to gains in profitability, productivity, and risk management capacity. The graph shows how much better the post-FinTech period performed than the pre-FinTech period. Therefore, the theory that FinTech significantly assist Indian banks in effectively handling market risk.

5. FINDINGS

There was quite a significant enhancement in ROA, growth in net profit, and growth in net interest income following the implementation of FinTech solutions. The public sector banks experienced an evident recovery of their profit performance post-FinTech. Analysis of transaction volumes and values of the UPI transactions showed significant increase in the number of digital transactions during the period. Real-time payment systems and digitization enabled easy accessibility of financial information to evaluate risks. FinTech helped identify the risks in the market quickly.

6. SUGGESTIONS:

Indian banks should strengthen the adoption of advanced FinTech technologies to improve market risk management. Real-time monitoring systems and data analytics tools should be widely implemented to enhance risk identification and decision-making. Banks should also invest in employee training programs to effectively utilize digital risk management solutions. Furthermore, regulators should promote innovation while ensuring strong cybersecurity and data protection measures. These initiatives will help banks reduce risk exposure and improve overall financial stability.

7. CONCLUSION

It can be observed that market risks resulting from changes in interest rates and exchange rates continue to pose significant problems to Indian banks. Nevertheless, the use of FinTech has made the task easier due to the increased capability of banks to detect and manage such risks through the adoption of advanced real-time data processing and

automatic reporting systems. The study has managed to identify and analyze market risks in relation to interest rate and exchange rate variations; it has compared the pre- and post-FinTech adoption strategies in managing market risks in Indian banks; it has analyzed the role played by FinTech in making real-time data processing possible; and it has also investigated the possibilities that may exist in the future in terms of the use of technology in the management of market risks.

In summary, the study reveals that FinTech has been instrumental in managing the market risks for Indian banks in recent times. With technology continually developing, there is no doubt that more advancements will take place through FinTech, which will go a long way in helping improve the risk management capabilities of banks in India. In other words, FinTech can be viewed as both a technological innovation and an imperative aspect in terms of market risk management in Indian banks.

References

- Brahmaiah, B. (2022). Market Risk Management Practices of the Indian Banking Sector: An Empirical Study. *International Journal of Economics and Financial Issues*. <https://doi.org/10.32479/ijefi.13160>
- Petřík, V. (2023). Impact of fintech on systemic risk in banking: literature review. *Krízový Manažment*. <https://doi.org/10.26552/krm.c.2023.1.38-45>
- Soni, Dr. R. (2017). Management of Risk in Indian Banking Industry.
- Agrawal, R., Antonyraj, Dr. S. M., Kumar, Mr. S., Karri, H., Meghani, K., & Mishra, B. M. (n.d.). A study of Risk Management on Private and Public Sector Banks in India.
- Chen Shiwei. (2023). The Impact of Fintech on the Risk-Taking of China's Commercial Banks. *Operations Research and Fuzziology*. <https://doi.org/10.12677/orf.2023.136640>
- Hong, X. (2025). Analysis of the Impact of Fintech on Systemic Risks in Commercial Banks. *Advances in Economics, Management and Political Sciences*. <https://doi.org/10.54254/2754-1169/2025.bl29049>
- Libda, R. E. M. (2024). The Impact of Fintech on Credit Risk Management: An Applied Study on the Egyptian Banking Sector. *Journal of Islamic Administrative Sciences*. <https://doi.org/10.21608/acj.2024.381062>.
- Sri, K. S., & SHIVANI, M. S. (2025). A Study on Evaluating Financial Performance of Reliance Limited through Financial Ratios. *IJSAT-International Journal on Science and Technology*, 16(3).
- S, J. (2025). Balancing Innovation And Regulation: A Study On Credit Risk Transfer Practices In Indian Financial Institutions. *International Journal For Multidisciplinary Research*. <https://doi.org/10.36948/ijfmr.2025.v07i05.58943>
- Krishna, R., & MUHAMMEDAMEEN., A. (n.d.). The Legal and Competitive Implications of Bank Fintech Mergers: Risks and Regulatory Challenges in Developing Countries Like India.