

Investigation of the Pre-Post-Merger Effects on the Financial Performance of Select Banks in India

Jasmine Maani, Dunstan Rajkumar A*

Department of Commerce, School of Social Sciences and Languages, Vellore Institute of Technology, Vellore, India. *Corresponding Author's Email: dunstanrajkumar.a@vit.ac.in

Abstract

Mergers and Acquisitions (M&A) have evolved as a tactical instrument for consolidating Financial Institutions and Banks in India, aiming to strengthen the capital base, extend business operations, and ensure financial stability, as part of the government's initiative to fortify the banking system, enhance its efficiency, and provide robust financial services. The mega-merger announcement on August 30, 2019, led to the amalgamation of ten public sector banks into four major banks. This research investigates the impact of mergers on the financial health of four bidder banks involved in the mega-merger from 2016–17 to 2022–23, utilizing standard accounting ratios, paired sample t-test, and an overall performance average analysis. The three years prior to and three years after the merger are compared in the study for accounting-based effectiveness. The investigation discovers a combined effect of mergers on overall financial performance ratios. Notably, Punjab National Bank demonstrates momentous improvements in 'Capital Adequacy Ratio' and 'Total Loan to Total Deposit Ratio'. Canara Bank notably impacts 'Debt-to-Equity Ratio' and 'Non-Performing Loans to Total Loans'. Concurrently, the Union Bank of India observes a significant effect on the 'Debt-to-Equity Ratio', while the Indian Bank exhibits a substantial change in 'Capital Adequacy Ratio' between the pre- and post-M&A time span.

Keywords: Financial Ratios, Leverage, Liquidity, Mega-merger, Profitability, Wealth of Shareholders.

Introduction

The progression of the Banking sector of India is essential for steering the economic development of the nation. Substantial expansion has been witnessed in the sector, propelled by an array of reforms and consequential mergers and acquisitions, signifying pivotal milestones in its ongoing evolution. A wave of consolidation has swept through the Indian financial industry, driven by a surge in M&A activity. Mergers and acquisitions are deemed crucial strategic decisions for advancing business growth (1). Comprehending the financial consequences of mergers and acquisitions in the Indian banking sector is essential for ensuring economic stability, operational efficiency, and regulatory compliance, thus promoting sustainable growth and competitive advantage.

In 1921, the formation of the 'Imperial Bank of India,' later transforming into the 'State Bank of India,' resulted from the significant merger of the 'Bank of Madras, the Bank of Bombay, and the Bank of Bengal.' This landmark occurrence represents the first-ever instance of a bank merger in the

banking sector of India, marking a pioneering milestone. Indian banking history delineates into two notable epochs: the era before liberalization and the era after liberalization. In 1969, a pivotal step was taken as the Indian government nationalized 14 banks during the pre-liberalization period, and this was followed by the nationalization of an additional six commercial banks in 1980. In 1993, following the post-liberalization period, a merger occurred between 'New Bank of India' and 'Punjab National Bank'. The consolidation resulted in a reduction in the count of nationalized banks from 20 to 19. In the post-liberalization era, the government embraced a liberalization policy, opening the doors to private banks by issuing licenses, thereby fostering the expansion of the sector. The banking sector of India has undergone substantial reforms under the Financial Sector Reform Initiatives, following a framework laid down by the Narasimhan Committee of 1991. The Indian Government and the Reserve Bank of India led these reforms with a view to establishing a strong financial system that

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would help boost growth. The banking sector is crucial for the performance of all other sectors as it provides both short-term and long-term funding options, and its failure could lead to other industries struggling to maintain their existence. Indian industries are grappling with global competition, leading to the adoption of various strategies, including mergers and acquisitions. Bank mergers play a pivotal role in fortifying the Indian economy by improving the banking sector. Commencing the M&A process involves conducting due diligence, in-depth market analysis of potential risks and opportunities, a close examination of the target's industry dynamics, and a rigorous evaluation of their competitive landscape (2). As financial intermediaries, commercial banks rely heavily on their lending performance for earnings. However, the rise in loan defaults has resulted in a substantial increase in non-performing advances, thereby adversely impacting their profitability (3). By consolidating resources, M&A in Indian banking can potentially reduce costs and unlock revenue growth, thereby facilitating industry expansion (4). Amalgamations aim to optimize financial resources and expand debt capacity by restructuring financial structures, benefiting shareholders by increasing leveraging, EPS, reducing capital costs, and increasing the present worth of outstanding shares, which will lead to long-term productivity (5). The government has integrated public sector banks in recent years. This is the impetus for conducting this investigation. The outcome of bank mergers is influenced by strategic fit, financial stability, regulatory requirements, operational efficiency, market conditions, leadership quality, and cultural compatibility. Effective management of these determinants enhances merger success and long-term value creation. Additionally, the megamerger intends to enhance credit capacity, establish strong national and international banks, reduce lending costs, implement next-generation technology, and improve market resource-raising capabilities. The research question aims to fill existing gaps in the examination of M&A activities in India.

1. How do mergers affect the financial performance of the chosen four major banks, both before and after the merger?
2. How does the financial performance of acquiring banks change in the post-merger period compared to the industry average, as

analyzed through various financial performance variables in both pre- and post-merger periods?

Non-Performing Assets (NPAs) are a significant issue in the banking system, hindering economic growth and jeopardizing the financial system. The government is preventing weaker banks from being wiped out of the market due to bad loans or NPAs by merging them with stronger ones. Merging banks can reduce legal and ancillary costs, as the same borrower may have taken loans from multiple banks. Annually, banks spend a substantial amount on the recovery of bad loans; by reducing such costs, banks can realize significant savings. Additionally, merging banks can monitor reckless funding, reduce non-performing assets, and ensure a more efficient financial system. Overall, this approach can significantly reduce financial burdens for banks. Indian banks have seen a surge in merger and acquisition activities. Initially, these mergers were made to save non-performing or inefficient banks, but over time, the system evolved to include business growth, global presence, improved market capitalization, profitability, and organizational structure. In 2017, 'State Bank of India (SBI)' etched its name in history with the largest banking consolidation in the country, merging with its 'five associate banks and Bharatiya Mahila Bank'. Nearly two years later, on January 21, 2019, the 'Reserve Bank of India (RBI)' reclassified 'IDBI Bank' as a private entity, impacting its regulatory framework. 'Life Insurance Corporation of India's (LIC)' acquisition of a 51% stake in the bank triggered its reclassification as a private entity. On April 1, 2019, 'Vijaya Bank and Dena Bank were absorbed by Bank of Baroda'. Following these mergers, the number of public bank chains in India decreased from 27 to 18. On August 30, 2019, one of the biggest mergers since the integration of SBI with five associate banks, announced in the banking arena, merged ten big public sector banks (PSBs) into four. The merger process has involved the 'merger of the United Bank of India and Oriental Bank for Commerce into Punjab National Bank; Canara Bank absorbed Syndicate Bank; Andhra Bank and Corporation Bank into Union Bank of India; and Allahabad Bank merged into Indian Bank'. Since the merger, the Indian public banking chain landscape has witnessed a decrease from 18

to 12 banks. This research delves into the financial health of four bidder banks (namely 'Punjab National Bank, Canara Bank, Indian Bank, and Union Bank of India'). It assesses different ratios associated with leverage, liquidity, profitability, and shareholders' wealth, specifically emphasizing notable variations before and after mergers. Mergers and Acquisitions (M&A) represent a tactical endeavor to consolidate the Indian banking sector, potentially improving stability, efficiency, financial health, profitability, and economies of scale. In developing countries such as India, horizontal mergers are frequently observed in the banking sector to strengthen banks and enhance market competitiveness. Limited research in the literature specifically addresses the financial challenges and performance evaluation of Indian M&A operations, utilizing a combination of review, qualitative analysis, and quantitative analysis.

The banking sector of India has been influenced by the 'Narasimham Committee II', which has suggested that mergers and acquisitions can result in greater economic and commercial benefits. This committee believes that strong mergers can have a "force multiplier effect". Mergers of equals have a more significant influence, while efficiency is subdued when a weak institution merges with a robust one. Forced mergers, often involving weaker and stronger banks, have been instrumental in safeguarding the interests of the depositors of the weaker bank (6). Companies pursue M&A for various reasons based on their objectives, but the primary motivation in the banking industry is to realize synergistic gains. Established theories on M&A assert that these synergistic advantages are typically realized over an extended period, as opposed to the short term. (7, 8). Both external and internal elements affect the efficiency of banking systems. Internal factors include expenditure-to-income ratio, capital adequacy, size, return on average total assets and liquidity. The structure of the financial market and macroeconomic variables are also factors to be considered (9). The commercial banks' operating performance has significantly improved after mergers, largely due to the reduction in operational costs resulting from merging merged and acquired companies (10). The consolidation of public sector banks in India aims to expand service outreach to rural areas and priority sectors, strengthen international presence, and enhance

competitiveness against larger global banks (11). Changes in merger control regulation lead to increased target announcement premia and market expectations of increased profitability (12). The financial performance of institutions involved can be substantially influenced by mergers and acquisitions in the financial chain of banking sector. Studies performed in Nigeria (13), India (14), and Ghana (15) have produced conflicting outcomes regarding the effect that mergers and acquisitions have on financial health and effectiveness. Studies also found positive relationships between mergers and acquisitions and financial performance variable factors such as net profit margin, return on assets, and return on equity (16). However, studies have also shown negative or insignificant relationships between mergers and acquisitions and financial performance indicators (17). Market-driven mergers boosted efficiency, while forced mergers led to a decline in efficiency (18). The effect of mergers and acquisitions on the financial health of an organization may vary depending on many factors, such as the specific financial indicators under examination, the efficacy of the merging entities, and the prevailing economic conditions. M&As have led to long-term synergy, including increased cash flow, combining resources, diversification, and cost reduction for acquiring firms (19). According to synergy theory, three different kinds of synergies—financial, operational, and management level synergies—have a significant impact on shareholders' wealth (20, 21). Various synergies of merger and acquisition process between two banks include increased value for the merged entity, serving a larger customer base with differentiated skills and products, geographical expansion, cost reduction, better resource utilization, consolidate debt, tax benefits, economies of scale, reduced competition and enhance the efficacy of the management team (22, 23). Analysts indicated that the consolidation process led to better pricing, lower costs for funds, etc. Amalgamation enhances value, efficiency, and market power of merged organizations by optimizing resource allocation (24). Mergers and Acquisitions offer a rapid, inorganic avenue for business expansion, providing a swift solution to achieving growth compared to the time-consuming and protracted nature of organic growth strategies (25). Examining the financial

effectiveness of the banking chain of India during the timeframe from 2003–2004 to 2013–2014, the study utilized ratio analysis and paired t-tests to evaluate the effects of mergers. The results showed that the net profit ratio, equity return, asset return, yield on loans, and yield on investment were all negatively impacted. However, following the merger, growth was displayed by positive trends in metrics like earnings per share, company per employee, and profit per employee (26). Bank mergers have led to enhanced profitability and increased cost efficiency. Moreover, the merged banks exhibit lower costs compared to their non-merged counterparts, attributed to their utilization of the most efficient technology (technical efficiency) and an input composition aimed at minimizing costs (allocative efficiency) (27). The consolidation of banks is favourable for the new amalgamated entity, shareholders, and customers, as it satisfies the growth and expansion needs of businesses (28). Employing ratio analysis and paired t-test, the assessment of the pre- and post-merger financial standing of two chosen banks in Nepal from 2013 to 2020 revealed a variety of consequences stemming from the first bank merger. While return on assets, profits per share, plus net interest margin all showed gains, the total effect on financial parameters was not entirely positive. On the other hand, except from dividends per share, the subsequent bank's merger had no impact on financial ratios prior to the post-mergers and acquisitions (M&A) era (29). Analyzing the wave of mergers and acquisitions that the Indian banking industry saw between 2000 and 2011, this study explores the effectiveness of post-merger performance by evaluating revenue generation, shareholders' wealth, liquidity, and share price volatility. The study finds substantial rises in market value to book value of both equity and earnings per share (EPS) using paired sample t-tests. The examination of merger announcements demonstrates a considerable reaction in stock prices within a brief period (30 days prior to and following the announcement), despite the Indian stock market's efficiency suggesting no meaningful influence on overall financial performance. Curiously, this effect fades with time, suggesting the stock market of India functions well over a prolonged period (30). In relation to profitability, productivity, as well as shareholder value, the US banking sector

performed better following M&A (31). Consolidations through horizontal mergers contribute positively to the performance of banks, particularly by improving cost efficiency (32). Both bank and non-bank acquisitions led to an enhancement in the long-term profitability of European credit entities, with bank acquisitions having a more significant impact (33). Analyzing the influence of banking mergers on individual business borrowers, with a specific focus on how these mergers affect the credit policies of banks, the study reveals that in-market mergers, especially those with smaller market shares, lead to favorable outcomes for borrowers through a contraction in interest rates. Nevertheless, as the acquired bank's local market share grows, the positive efficiency impact is counteracted by an increase in market power. Moreover, mergers exhibit varying distributional effects among borrowers, with larger banks tending to curtail the provision of loans to smaller borrowers (34). The investigation of the efficiency level of 30 Vietnamese commercial banks during the 2011–2019 period indicates that M&As negatively impact banking efficiency, suggesting that implementing CAMELS standards can enhance efficiency, emphasizing the importance of understanding these impacts for future developments (35). The study explores on how M&A transactions have grown in India over the last 20 years and evaluates how they have affected the acquiring firms' accounting-based performance. Using paired t-tests, the research compares the success of 68 mergers that took place between 2007–2008 and 2011–2012, concentrating on variables like profitability, liquidity, and solvency. The research also compares the performance of companies in the industrial and service sectors before and after mergers. The findings indicate that, over a five-year period, mergers had a significant impact on profitability and liquidity but showed no substantial effect on solvency. Notably, service sector firms outperformed their manufacturing counterparts, demonstrating significant improvements in accounting variables in the medium term (36). An examination of financial ratios (including 'profitability, liquidity, leverage, and shareholder wealth ratios') both prior to and following mergers in Nepalese commercial banks spanning from 2013 to 2020, utilizing a paired sample t-test, revealed notable

enhancements in liquidity and leverage ratios across the entire commercial banking sector during the post-merger timeframe. But after the M&A agreements, metrics like revenue growth and wealth of shareholders ratios showed inconsistent or negligible results (37). Financial ratios are a key instrument for evaluating performance (38, 39). The factors that could potentially result in better outcomes have been considered in this research. The variables and statistical analyses for this study have been determined by reviewing the existing literature.

After exploring the existing literature on the effects of mergers and acquisitions (M&A) on Indian banks' financial performance, researchers found that, prior to the notification of the megamerger on August 30, 2019, most studies had concentrated on banks. These studies revealed that the effects of previous M&As on financial performance had been insufficient. Notably, there is a paucity of research on recent mergers involving Public Sector Banks (PSBs). Given the substantial M&A activity in the Indian banking sector, addressing this research gap is essential. To ascertain the megamerger's long-term impact on financial performance, it is necessary to examine the financial efficiency and effectiveness of the bidding banks because the scientific research on financial performance analysis of megamerger has not been evaluated. The four bidder banks in the August 30, 2019, megamerger is taken into account in this analysis for the years 2016–17 through 2022–23. This research is crucial for evaluating how mergers impact bank financial performance in India, guiding informed decision-making by policymakers, regulators, and banking executives to enhance stability and efficiency in the sector. It provides valuable insights for government, policymakers, and investors, offering analysis on industry trends, growth patterns, and the effects of mergers on Indian banks, informing strategic investment decisions and positioning in the market. Furthermore, this study serves as a useful benchmark for future research on mergers and acquisitions in emerging economies. In order to create plans for their success, future bank consolidations in India will evaluate the effects of mergers and acquisitions on the financial services sector. This will help close current information gaps and provide scholars a better grasp of this field of study. 'The primary goals are to examine

the pre- and post-effects of M&A on the financial performance of four bidder banks in the megamerger and to provide a comparative analysis of four bidder banks in the megamerger.' The remaining sections of this paper are organized as follows: Section 2 gives an overview of the research methodology, followed by Section 3, which looks at analysing specific financial parameters. Lastly, the conclusions of the study are set out in Section 4.

Methodology

To evaluate the hypothesis, this study uses a time period of three years prior to and three years following the merger event, for a total research period of seven years. The year of the merger is indicated as (T0), while the three years that preceded and followed it are designated as (T-3, T-2, T-1) along with (T+1, T+2, T+3), respectively. To lessen the impact of M&A, the merger year (T0) is excluded from the financial performance review. After the ratio analysis, the hypothesis is tested at a level of significance of 5% using an SPSS paired sample t-test. The research design used for this study is descriptive. The sample of this study comprises of four banks, namely, 'Canara Bank, Punjab National Bank, Indian Bank, and Union Bank of India,' which were chosen as per the mentioned criteria:

- Banks that have recently merged during 2019–20.
- Banks have domestic merger.
- Banks belongs to the public sector.

This research investigation relies on secondary data sourced from the Prowess database of the Centre for Monitoring Indian Economy (CMIE), the Reserve Bank of India (RBI) publication—Statistical Tables Relating to Banks in India, and the annual reports of selected individual banks. The analysis spans from the fiscal year 2016–2017 to 2022–2023, chosen primarily to analyze the mega merger effect of banks that happened in India during this period.

For financial analysis, various variables are employed, including Return on Equity, Return on Assets, Net Interest Margin, Cash and Cash Equivalent to Total Assets, Investment to Total Assets Ratio, Debt to Equity Ratio, Capital Adequacy Ratio, Total Loan to Total Deposit Ratio, Non-Performing Loans to Total Loans, Equity Per Share, and Market Price Per Share. These variables have been chosen by various researchers in the

past studies (40-54). These variables are important in order to evaluate the financial performance of the banks with respect to the parameters of profitability, liquidity, leverage, and the wealth of shareholders. The present study considers these variables.

In this study, a paired t-test is employed to assess the comparative position of long-term financial performance before and after a merger. The

significance of the paired t-test in examining this comparative aspect has been recognized and utilized by various researchers in prior studies (55 - 59).

The hypotheses are formulated for each variable separately for performing the paired t-test. The time periods before and after the merger are denoted as BM (Before Merger) and AM (After Merger), respectively.

Table 1: Hypotheses Pertaining to Individual Variables

Parameters	Variables Names	Description/Measurement
Profitability:	Return on Equity (ROE)	Net profit after tax/Total Equity
	Return on Assets (ROA)	Net profit after tax/Total Assets
	Net Interest Margin (NIM)	Interest earned-interest expense/Total Assets
Liquidity:	Cash & Cash Equivalent to Total Assets (CETA)	Cash & Cash Equivalent/Total Assets
	Investment to Total Assets Ratio (ITA)	Investment/Total Assets
Leverage:	Debt to Equity Ratio (DE)	Total debt/Total Equity
	Capital Adequacy Ratio (CAR)	Total Equity/Total Assets
	Total Loans to Total Deposit Ratio (TLOTD)	Total Loans/Total Deposit
	Non-Performing Loans to Total Loans (NPL)	Total Non-Performing Loans/Total Loans
Wealth of Shareholders:	Earnings Per Share (EPS)	Net profit after tax/No. of ordinary shares
	Market Price Per Share (MPS)	Closing price of ordinary shares traded on the stock exchange

Results and Discussion

Two different methodologies are used in this study to undertake analyses: i) Evaluating financial performance prior to and following the merger, and ii) Analyzing the overall performance average.

The Pre- and Post-merger Financial Performance Measurement

The average value for the three years prior to and three years after the merger is used to compare each variable. The results for each of the four banks are shown Table 1.

Table 2: Comparison of Pre- and Post-Merger Financial Ratios of Punjab National Bank

Parameters	Pre-Merger	Post-Merger	Change	Relative Change (%)
Profitability Parameters				
Return on Assets (ROA)	-0.89	0.20	1.09	-122.47
Return on Equity (ROE)	-16.49	3.31	19.80	-120.07
Net Interest Margin (NIM)	2.13	2.57	0.44	20.66
Liquidity Parameters				
Cash & Cash Equivalent to Total Assets (CETA)	11.59	9.8	-1.79	-15.44
Investment to Total Assets Ratio (ITA)	26.37	29.47	3.10	11.76
Leverage Parameters				
Debt to Equity Ratio (DE)	1.19	0.62	-0.57	-47.90
Capital Adequacy Ratio (CAR)	10.2	14.77	4.57	44.80

Total Loans to Total Deposit Ratio (TLOTD)	67.62	63.16	-4.46	-6.60
Non- Performing Loans to Total Loans (NPL)	8.54	4.42	-4.12	-48.24
Wealth of Shareholders Parameters				
Earnings Per Share (EPS)	-26.2	3.07	29.27	-111.72
Market Price Per Share (MPS)	104.62	56.83	-47.79	-45.68

Table 3: Paired Samples Test of the Punjab National Bank

		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Profitability Ratios									
Pair 1	ROA (Pre- Post)	-1.08333	0.99631	0.57522	-3.55830	1.39164	-1.883	2	0.200
Pair 2	ROE (Pre- Post)	-19.80667	18.28145	10.55480	-65.22031	25.60697	-1.877	2	0.201
Pair 3	NIM (Pre-Post)	-0.44000	0.33867	0.19553	-1.28131	0.40131	-2.250	2	0.153
Liquidity Ratios									
Pair 4	CETA (Pre- Post)	1.78333	2.25465	1.30172	-3.81752	7.38419	1.370	2	0.304
Pair 5	ITA (Pre- Post)	-3.10000	2.16730	1.25129	-8.48388	2.28388	-2.477	2	0.132
Leverage Ratios									
Pair 6	DE (Pre- Post)	0.57000	0.31432	0.18148	-0.21083	1.35083	3.141	2	0.088
Pair 7	CAR (Pre- Post)	-4.57667	1.67643	0.96789	-8.74116	-.41217	-4.728	2	0.042
Pair 8	TLOTD (Pre- Post)	4.46667	1.75890	1.01550	0.09731	8.83602	4.398	2	0.048
Pair 9	NPL (Pre- Post)	4.12000	2.19344	1.26639	-1.32882	9.56882	3.253	2	0.083
Wealth of Shareholders									
Pair 10	EPS (Pre- Post)	-29.27333	30.83481	17.80249	-105.87126	47.32459	-1.644	2	0.242
Pair 11	MPS (Pre-Post)	47.78333	76.66665	44.26351	-142.66719	238.23386	1.080	2	0.393

Table 2 shows that Punjab National Bank improved in three profitability ratios during the post-merger timeframe. Nevertheless, the paired t-test results in Table 3 demonstrate that 'there is no significant difference in ROA, ROE, and NIM ratios between the pre- and post-merger periods at a 5% significance level'. So, hypotheses H01, H02, and H03 are considered, concluding that M&A does not

have a major effect on the 'ROE, ROA, and NIM ratios'. It is worth noting that Table 2 highlights a 20.66% increase in 'NIM' during the post-merger period, indicating effective use of shareholders' funds and assets by the management. This has resulted in a gradual but noteworthy increase in interest income. The analysis suggests a moderate change rather than a substantial increase.

In Table 2, the liquidity ratios for Punjab National Bank display mixed outcomes in the post-merger period. However, Table 3 illustrates that the observed improvement in 'the ITA ratio and the decline in the CETA ratio are not statistically significant at a 5% significance level based on the paired t-test results. Consequently, hypotheses H04 and H05 are accepted, leading to the conclusion that M&A has no major impact on 'CETA and ITA' during the pre-post-merger period. The 'ITA ratio' enhanced by 11.76%, establishing an improvement in the bank's productivity after the merger. Conversely, the negative decline of 15.44% in 'CETA' during the period of post-merger suggests a reduction in the bank's liquidity.

Table 2 shows how Punjab National Bank's leverage parameters improved after a merger. The outcomes of the paired t-test in Table 3 indicate that 'there were significant improvements in the CAR and TLOTD ratios'. However, the improvements in 'the DE and NPL ratios were not statistically significant at a 5% significance level'. So, hypotheses H07 and H08 were dismissed, while hypotheses H06 and H09 were accepted. In conclusion, the M&A had a significant impact on the 'CAR and TLOTD ratios', but not on the 'DE and NPL ratios' in the pre-post-merger period. The

major improvement in the 'CAR' ratio by 44.80% during the post-merger period is a positive indication that the bank can handle unforeseeable losses, keeping its rate above the central bank's rate of 12%. While, the negative drop of 6.60% in 'TLOTD' during the post-merger period recommends that the bank needs to optimize deposit amounts to increase profitability. Additionally, the positive 47.90% improvement in the 'DE ratio' during the post-merger period suggests that the bank can fulfill its long-term obligations. Moreover, the 48.24% improvement in the 'NPL ratio' during the post-merger period suggests that the bank's recovery strategy effectively reduces non-performing loans and contributes to profit generation.

Punjab National Bank's shareholders' wealth parameters show an improvement in 'EPS ratio' compared to Table 2. However, 'the t-test results presented in Table 3 show that statistical validation at 5% significance level is not achieved for observed improvements in EPS and a reduced performance of MPS ratios'. Therefore, hypotheses H10 and H11 are accepted, leading to the conclusion that mergers have no momentous impact on 'EPS and MPS ratio'.

Table 4: Comparison of Pre-and Post-Merger Financial Ratios of Canara Bank

Parameters	Pre-Merger	Post-Merger	Change	Relative Change (%)
Profitability Parameters				
Return on Assets (ROA)	-0.16	0.52	0.68	-425.00
Return on Equity (ROE)	-2.59	9.91	12.50	-482.63
Net Interest Margin (NIM)	1.99	2.25	0.26	13.07
Liquidity Parameters				
Cash & Cash Equivalent to Total Assets (CETA)	9.09	13.31	4.22	46.42
Investment to Total Assets Ratio (ITA)	25.27	24.86	-0.41	-1.62
Leverage Parameters				
Debt to Equity Ratio (DE)	1.09	0.73	-0.36	-33.03
Capital Adequacy Ratio (CAR)	12.75	14.99	2.24	17.57
Total Loans to Total Deposit Ratio (TLOTD)	71.13	66.16	-4.97	-6.99
Non- Performing Loans to Total Loans (NPL)	6.40	2.73	-3.67	-57.34
Wealth of Shareholders Parameters				
Earnings Per Share (EPS)	-10.93	38.73	49.66	-454.35
Market Price Per Share (MPS)	285.6	302.85	17.25	6.04

Table 5: Paired Samples Test of the Canara Bank

		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
	Profitability Ratios								
Pair 1	ROA (Pre- Post)	-0.68333	0.60707	0.35049	-2.19138	0.82471	-1.950	2	0.191
Pair 2	ROE (Pre- Post)	-12.50667	10.29039	5.94116	-38.06941	13.05608	-2.105	2	0.170
Pair 3	NIM (Pre-Post)	-0.25333	0.17388	0.10039	-0.68527	0.17860	-2.524	2	0.128
	Liquidity Ratios								
Pair4	CETA (Pre- Post)	-4.24333	2.95685	1.70714	-11.58854	3.10188	-2.486	2	0.131
Pair 5	ITA (Pre- Post)	0.41667	2.39953	1.38537	-5.54409	6.37742	0.301	2	0.792
	Leverage Ratios								
Pair 6	DE (Pre- Post)	0.36000	0.02646	0.01528	0.29428	0.42572	23.568	2	0.002
Pair 7	CAR (Pre- Post)	-2.23667	2.27060	1.31093	-7.87715	3.40382	-1.706	2	0.230
Pair 8	TLOTD (Pre- Post)	4.96333	3.60057	2.07879	-3.98099	13.90766	2.388	2	0.140
Pair 9	NPL (Pre- Post)	3.66333	1.15518	0.66694	0.79372	6.53295	5.493	2	0.032
	Wealth of Shareholders								
Pair 10	EPS (Pre- Post)	-49.66000	53.55366	30.91922	-182.69468	83.37468	-1.606	2	0.249
Pair 11	MPS (Pre-Post)	-17.25000	161.16014	93.04585	-417.59s398	383.09398	-0.185	2	0.870

Table 4 shows that Canara Bank improved all three profitability ratios in the post-merger period. Nevertheless, 'the paired t-test results in Table 5 indicate that there is no statistically significant difference in the enhancements of ROA, ROE, and NIM ratios between the pre- and post-merger periods at a 5% level'. So, hypotheses H01, H02, and H03 are considered, leading to the conclusion that M&A has no significant impact on 'ROE, ROA, and NIM ratios'. It is worth noting that Table 4 demonstrates a 13.07% increase in 'NIM', which indicates the beginning of growth in interest income during the post-merger period.

The liquidity ratios of Canara Bank display different outcomes in the post-merger period when it comes to the 'CETA and ITA ratios'. However, according to 'the paired t-test results in Table 5, the CETA and ITA ratios are not statistically significant at a 5% level'. So that, null

hypotheses H04 and H05 have been accepted, indicating that M&A has no compelling impact on 'CETA and ITA' before and after the merger period. The observed increase of 46.42% in 'CETA' suggests that there has been an improvement in the bank's liquidity level.

Table 4 shows the leverage ratios of Canara Bank. However, according to Table 5, 'the paired t-test results indicate that CAR and TLOTD ratios are not statistically significant'. While 'the improvements in DE and NPL ratios are statistically significant at a 5% level'. As a result, hypotheses H07 and H08 are accepted, while hypotheses H06 and H09 are rejected. The remarkable 57.34% improvement in the 'NPL ratio' during the post-merger period highlights the bank's effective recovery strategy in resolving non-performing loans and generating profit. Furthermore, the noteworthy 33.03% improvement in the 'DE ratio' during the post-

merger period suggests an improvement in the bank's financial capability to meet long-term commitments. However, the 17.57% improvement in the 'CAR' during the post-merger period suggests an increased capacity of the bank to absorb unforeseeable losses.

Canara Bank's shareholder wealth parameter has shown improvement following the merger.

However, the results of 'the paired t-test presented in Table 5 indicate that the improvements in both EPS and MPS ratios do not have statistical significance at a 5% level'. As a result, we conclude that both hypotheses H10 and H11 are accepted, and M&A does not have a pivotal impact on 'EPS and MPS ratio'.

Table 6: Comparison of Pre- and Post-Merger Financial Ratios of Union Bank of India

Parameters	Pre-Merger	Post-Merger	Change	Relative Change (%)
Profitability Parameters				
Return on Assets (ROA)	-0.51	0.46	0.97	-190.20
Return on Equity (ROE)	-10.15	8.05	18.2	-179.31
Net Interest Margin (NIM)	2.05	2.63	0.58	28.29
Liquidity Parameters				
Cash & Cash Equivalent to Total Assets (CETA)	8.65	8.87	0.22	2.54
Investment to Total Assets Ratio (ITA)	25.40	29.16	3.76	14.80
Leverage Parameters				
Debt to Equity Ratio (DE)				
Capital Adequacy Ratio (CAR)	1.73	0.69	-1.04	-60.12
Total Loans to Total Deposit Ratio (TLOTD)	11.68	14.37	2.69	23.03
Non- Performing Loans to Total Loans (NPL)	72.74	65.48	-7.26	-9.98
	7.28	3.33	-3.95	-54.26
Wealth of Shareholders Parameters				
Earnings Per Share (EPS)	-28.51	8.23	36.74	-128.87
Market Price Per Share (MPS)	95.00	76.37	-18.63	-19.61

The performance metrics display an increase in the three ratios of Union Bank of India after the merger, as shown in Table 6. However, according to 'the paired t-test outcomes mentioned in Table 7, the progress in ROA, ROE, and NIM ratios during the pre-post-merger period is not statistically significant at a 5% level'. So, the hypotheses H01, H02, and H03 are affirmed, indicating that the merger has no substantial effect on 'ROA, ROE, and NIM ratios'.

The results for liquidity ratios in Table 7 show that 'the CETA and ITA ratios do not have statistical significance at a 5% level, as per the paired t-test'. This implies that hypotheses H04 and H05 are accepted. As a result, it can be drawn to a conclusion that the M&A of Canara Bank has no major impact on 'CETA and ITA ratios' during the pre-post-merger period. It is worth noting that the 'ITA ratio' increased by 14.80% in the post-merger period.

Table 6 illustrates the leverage parameters of Union Bank of India, which indicates that three out of four ratios have improved during the post-merger period. 'The paired t-test results in Table 7 explain that the improvement in the DE (debt-to-equity) ratio is statistically significant, while the improvements in the Capital Adequacy Ratio (CAR) and Non-Performing Loan (NPL) ratios are statistically insignificant at a 5% level'. Therefore, we can reject hypothesis H06 and accept hypotheses H07, H08 and H09. This means that the merger has a momentous impact on the 'DE ratio', indicating improved financial leverage to meet long-term obligations. However, the impact on 'CAR, Total Loans to Total Deposits (TLOTD), and NPL ratios' during the pre- and post-merger period is deemed insignificant. The substantial 60.12% improvement in the 'DE ratio' suggests enhanced financial leverage, while the noteworthy 23.03% improvement in 'CAR' indicates an increased capacity to absorb unforeseeable losses.

Additionally, the 54.26% decrease in 'NPL' during the post-merger period reflects the effectiveness of the bank's recovery plan in reducing non-performing loans.

The 'EPS ratio' of Union Bank of India, which represents shareholders' wealth, has improved after the merger. However, the statistical analysis

in Table 7 reveals that 'the improvements in both EPS and MPS ratios were not significant at a 5% level'. Therefore, the hypotheses H10 and H11 are accepted, indicating that the merger activity did not have a significant impact on either 'EPS or MPS ratio'.

Table 7: Paired Samples Test of the Union Bank of India

		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
	Profitability Ratios								
Pair 1	ROA (Pre- Post)	-0.97333	0.73711	0.42557	-2.80442	0.85775	-2.287	2	0.149
Pair 2	ROE (Pre- Post)	-18.20000	14.08329	8.13099	-53.18484	16.78484	-2.238	2	0.155
Pair 3	NIM (Pre- Post)	-0.58333	0.36611	0.21137	-1.49279	0.32612	-2.760	2	0.110
	Liquidity Ratios								
Pair4	CETA (Pre- Post)	-0.21667	0.34588	0.19969	-1.07588	0.64255	-1.085	2	0.391
Pair 5	ITA (Pre- Post)	-3.76000	2.75349	1.58973	-10.60005	3.08005	-2.365	2	0.142
	Leverage Ratios								
Pair 6	DE (Pre- Post)	1.04000	0.07810	0.04509	0.84598	1.23402	23.064	2	0.002
Pair 7	CAR (Pre- Post)	-2.69667	1.77314	1.02372	-7.10140	1.70806	-2.634	2	0.119
Pair 8	TLOTD (Pre- Post)	7.25667	4.22857	2.44137	-3.24769	17.76103	2.972	2	0.097
Pair 9	NPL (Pre- Post)	3.94667	1.74127	1.00532	-0.37890	8.27223	3.926	2	0.059
	Wealth of Shareholders								
Pair 10	EPS (Pre- Post)	-36.73667	40.30817	23.27193	-136.86770	63.39437	-1.579	2	0.255
Pair 11	MPS (Pre- Post)	18.63333	76.54968	44.19598	-171.52661	208.79328	0.422	2	0.714

Table 8: Comparison of pre-and post-merger financial ratios of Indian Bank

Parameters	Pre-Merger	Post- Merger	Change	Relative Change (%)
Profitability Parameters				
Return on Assets (ROA)	0.44	0.63	0.19	43.18
Return on Equity (ROE)	5.73	10.22	4.49	78.36
Net Interest Margin (NIM)	2.82	3.04	0.22	7.80
Liquidity Parameters				
Cash & Cash Equivalent to Total Assets (CETA)	5.62	9.17	3.55	63.17
Investment to Total Assets Ratio (ITA)	27.54	26.99	-0.55	-2.00
Leverage Parameters				
Debt to Equity Ratio (DE)	0.8	0.5	-0.3	-37.50
Capital Adequacy Ratio (CAR)	13.13	16.24	3.11	23.69
Total Loans to Total Deposit Ratio (TLOTD)	73.35	68.52	-4.83	-6.58
Non- Performing Loans to Total Loans (NPL)	3.98	2.18	-1.8	-45.23
Wealth of Shareholders Parameters				
Earnings Per Share (EPS)	20.73	33.80	13.07	63.05
Market Price Per Share (MPS)	240.40	283.67	43.27	18.00

Table 9: Paired Samples Test of the Indian Bank

		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
	Profitability Ratios								
Pair 1	ROA (Pre- Post)	-0.19333	0.41789	0.24127	-1.23143	0.84477	-0.801	2	0.507
Pair 2	ROE (Pre- Post)	-4.49000	5.91135	3.41292	-19.17462	10.19462	-1.316	2	0.319
Pair 3	NIM (Pre- Post)	-0.22000	0.19000	0.10970	-0.69199	0.25199	-2.006	2	0.183
	Liquidity Ratios								
Pair 4	CETA (Pre- Post)	-3.55333	3.44776	1.99056	-12.11804	5.01137	-1.785	2	0.216
Pair 5	ITA (Pre- Post)	0.54333	3.19101	1.84233	-7.38357	8.47024	0.295	2	0.796
	Leverage Ratios								
Pair 6	DE (Pre- Post)	0.30333	0.33081	0.19099	-0.51844	1.12510	1.588	2	0.253
Pair 7	CAR (Pre- Post)	-3.11000	0.96628	0.55788	-5.51038	-0.70962	-5.575	2	0.031
Pair 8	TLOTD (Pre- Post)	4.82667	4.14408	2.39259	-5.46781	15.12114	2.017	2	0.181
Pair 9	NPL (Pre- Post)	1.80333	0.94299	0.54444	-0.53919	4.14585	3.312	2	0.080
	Wealth of Shareholders								
Pair 10	EPS (Pre- Post)	-13.07333	20.09493	11.60181	-62.99191	36.84524	-1.127	2	0.377
Pair 11	MPS (Pre- Post)	-43.26667	281.10287	162.29482	-741.56491	655.03157	-0.267	2	0.815

Indian Bank's profitability ratios improved during the post-merger period, as indicated in Table 8. However, Table 9 reveals that 'the paired t-test results indicate that the observed improvements in the ROA, ROE, and NIM ratios are not statistically significant'. The p-values exceed the 5% significance level, leading to the acceptance of null hypotheses H01, H02, and H03. This implies that the 'ROA, ROE, and NIM ratios' are not significantly impacted by the merger. A notable 43.18% growth in 'ROA' throughout the post-merger period suggests that the management made effective and efficient use of assets to produce profit. The notable 78.36% rise in 'ROE' shows that the money invested by shareholders was used to create additional income.

Table 9 displays the outcomes of the paired t-test conducted on liquidity ratios. The test found that both 'the CETA and ITA ratios were not statistically significant at a 5% level'. As a result, hypotheses H04 and H05 are accepted, and we conclude that Indian Bank's M&A had no momentous impact on 'CETA and ITA ratios' during the pre-post-merger period. Nevertheless, the observed 63.17% increase in 'CETA' indicates an improvement in the bank's liquidity after the merger. Meanwhile, the consistent 'ITA' level suggests that the bank's productivity remained unchanged in the post-merger period.

'The paired t-test for Indian Bank's leverage ratios shows that the Capital Adequacy Ratio (CAR) is statistically significant, while the Debt Equity (DE), Total Loans to Total Deposits (TLOTD), and Non-Performing Loans (NPL) ratios are statistically

insignificant at a 5% significance level'. This means that the hypothesis H07 is rejected, indicating that there is a significant impact of mergers on 'CAR'. On the other hand, hypotheses H06, H08, and H09 are accepted, indicating that there is an inconsequential impact on 'DE, TLOTD, and NPL ratios' before and after the merger. The 'CAR ratio' increased by 23.69% during the post-merger period, represents an improvement in the bank's ability to withstand financial risks and economic stress. Additionally, the 'DE ratio' improved by 37.50% during the post-merger period, indicating an increase in the bank's capacity to meet its long-term obligations. Moreover, the 'NPL ratio' decreased by 45.23%, signifying that the bank's recovery methodology was effective in managing non-performing loans, leading to profit generation. Similarly, during the post-merger period, the parameters reflecting shareholders' wealth showed improvements. However, the results of 'the paired t-test presented in Table 9 indicate that the enhancements observed in the Earnings Per Share (EPS) and Market Price Per Share (MPS) ratios were not statistically significant at a 5% confidence level during both pre- and post-merger periods'. Consequently, the null hypotheses H10 and H11 are accepted, concluding that the mergers had no major impact on 'earnings per share and market price per share'. Despite a capital infusion in the short term to meet minimum capital requirements, there was a noteworthy 63.05% improvement in the 'EPS ratio' during the post-merger period.

Table 10: Overall Performance Average Analysis

Particulars		Period	Punjab Nation al Bank	Canar a Bank	Unio n Bank of India	Indian Bank	Average of all banks
Profitability Parameters	Return on Assets (%)	Pre- Merger	-0.89	-0.16	-0.51	0.44	-0.28
		Post- Merger	0.20	0.52	0.46	0.63	0.45
	Return on Equity (%)	Pre- Merger	-16.49	-2.59	-10.15	5.73	-5.88
		Post- Merger	3.31	9.91	8.05	10.22	7.87
	Net Interest Margin (%)	Pre- Merger	2.13	1.99	2.05	2.82	2.25
Post- Merger		2.57	2.25	2.63	3.04	2.62	
Liquidity Parameters	Cash & Cash Equivalent to Total Assets (%)	Pre- Merger	11.59	9.09	8.65	5.62	8.74
		Post- Merger	9.8	13.31	8.87	9.17	10.29
	Investment to Total Asset (%)	Pre- Merger	26.37	25.27	25.4	27.54	26.15
		Post- Merger	29.47	24.86	29.16	26.99	27.62
Leverage Parameters	Debt to Equity Ratio	Pre- Merger	1.19	1.09	1.73	0.80	1.20
		Post- Merger	0.62	0.73	0.69	0.50	0.64
	Capital Adequacy Ratio (%)	Pre- Merger	10.2	12.75	11.68	13.13	11.94
		Post- Merger	14.77	14.99	14.37	16.24	15.09
		Pre- Merger	67.62	71.13	72.74	73.35	71.21

Wealth of Shareholders Parameters	Total Loan to Total Deposit Ratio (%)	Post- Merger	63.16	66.16	65.48	68.52	65.83
	Non-Performing Loans to Total Loans (%)	Pre- Merger	8.54	6.40	7.28	3.98	6.55
		Post- Merger	4.42	2.73	3.33	2.18	3.17
	Earnings Per Share (Rs.)	Pre- Merger	-26.2	-10.93	-28.51	20.73	-11.23
		Post- Merger	3.07	38.73	8.23	33.8	20.96
	Market Price Per Share (Rs.)	Pre- Merger	104.62	285.60	95	240.4	181.41
		Post- Merger	56.83	302.85	76.37	283.67	179.93

Table 10 illustrates a comprehensive analysis of the average performance across various financial variables for banks engaged in mergers. Among all the banks, Indian Bank stands out with a higher 'Return on Assets' in comparison to the mean of all banks, both before and after the merger, with Union Bank of India and Canara Bank coming in second and third, respectively. Both prior to and following the merger, Indian Bank's 'Return on Equity' was greater than the industry average. When compared to the average of all banks, Indian Bank, Canara Bank, and Union Bank of India showed higher Return on Equity rates. Both before and after the merger, the Indian Bank had a larger 'Net Interest Margin' than the average for all banks, with Union Bank of India coming in second. In terms of liquidity criteria, the pre-merger average of all banks was surpassed by the Punjab National Bank and Canara Bank, respectively, with greater 'Cash and Cash Equivalent to Total Assets'. Canara Bank outperformed average in terms of 'Cash and Cash Equivalent to Total Assets (CETA)' throughout the post-merger period. On the other hand, the CETA values of the remaining banks are lower than average. Prior to the merger, the Indian bank's 'Investment to Total Assets' ratio was greater than the industry average. After the merger, Union Bank of India and Punjab National Bank both had ratios that were higher than usual. Within the leverage constraints, a 'Debt-to-Equity ratio' of 1.5 or less is seen beneficial; a ratio greater than 2 is deemed less so. Following the merger, the D/E ratios of all the banks changed favorably. Prior to the merger, Indian Bank had a greater 'Capital Adequacy Ratio (CAR)' over the industry average, followed by Canara Bank. Nonetheless, Indian Bank's CAR in the post-merger period is more than the average of all banks, while the average is lower for the other institutions. Both before and after the merger, the Indian Bank outperformed all other banks in terms of its 'Total Loan to Total Deposit ratio'. Following the merger, the 'Non-Performing Assets (NPA)' of every bank showed improvement. Better credit risk management was demonstrated

by the Indian Bank, which outperformed the typical bank. The total asset quality increased as a consequence. Regarding shareholder wealth, Canara Bank outperformed all other banks in the post-merger period, although Indian Bank outperformed all other banks in the pre-merger period in terms of 'Earnings Per Share'. Furthermore, both before and after the merger, Canara Bank had greater 'Market Price Per Share' in comparison with the average for all banks, with Indian Bank coming in second.

Conclusion

This study aims to assess the influence of mergers on the financial performance of specific banks ('Punjab National Bank, Canara Bank, Union Bank of India, and Indian Bank') during the periods before and after the M&A. The financial performance of Punjab National Bank has indicated improvements across various ratios. Notably, leverage ratios such as the 'Capital Adequacy Ratio (CAR) and Total Loan to Total Deposit Ratio (TLOTD)' demonstrated significant enhancement, while other ratios exhibited no significant changes during the post-merger period. The improvement in leverage ratios indicates that they are managing their debt levels more prudently, thereby potentially reducing the financial risk. This can enhance their stability and loss-absorbing capacity. Conversely, the M&A impact on the financial performance of the Canara Bank shows that the leverage ratio such as 'Debt-to-Equity ratio and Non-Performing Loans to Total Loans (NPL)' improved significantly. Improvement of 'NPLs' indicates a reduction in the proportion of loans that are not being repaid as per the agreed terms. This is a positive sign, showcasing better asset quality and risk management within the bank. It can lead to enhanced financial stability, improved investor and depositor confidence, and potentially lower provisioning for bad loans, ultimately benefiting the bank's overall performance and reputation. However, other key indicators such as profitability ratios, liquidity ratios, and shareholder wealth ratios did not

improve significantly. But the overall financial performance of Canara Bank shows improvement in the post-merger period, except for the 'Investment to Total Asset (ITA) and Total Loan to Total Deposit (TLOTD)'. Here the moderate improvement is noteworthy in the post-merger period. The financial performance of Union Bank of India indicates enhancements in all ratios, except for the 'Total Loan to Total Deposit Ratio (TLOTD) and Market Price Per Share (MPS)'. Notably, leverage ratios such as the 'debt-to-equity ratio' demonstrated significant improvement, indicating enhanced financial leverage. However, the improvements in other indicators of profitability ratios, liquidity ratios, and wealth of shareholders ratios were deemed insignificant during the post-merger period. The M&A process with Indian Bank significantly influenced the 'Capital Adequacy Ratio (CAR)' in the post-merger period. A high capital adequacy ratio percentage indicates a bank's good financial health, allowing it to efficiently handle unexpected losses or significant borrower defaults compared to a bank with a low percentage. The result shows that the improvement in all the ratios except the 'Investment to Total Asset Ratio (ITA), and Total Loan to Total Deposit Ratio (TLOTD)'. Nevertheless, it is crucial to emphasize that the observed enhancements in these ratios are not statistically significant. The results of this study indicate that the financial performance of the banks demonstrates diverse outcomes in the periods before and after the mergers. The study advocates for the engagement of commercial banks in mergers with other commercial banks to leverage synergistic benefits, diversify risks, achieve cost efficiency, and enhance competitiveness.

The findings on M&A in India's banking can reshape policies, influencing regulatory adjustments for smoother processes and stricter financial monitoring. Bank executives can enhance financial performance post-merger by aligning M&A with strategic goals, mitigating transaction risks, focusing on asset quality, capital adequacy, and management quality, and leveraging improved financial ratios. Optimizing capital utilization, diversifying revenue streams, enhancing cost efficiency, fostering partnerships, and prioritizing customer-centricity and risk management are key strategies for sustained growth and value creation.

Policymakers can enhance M&A success in banking by creating robust integration strategies and policies that encourage synergy gains and financial performance improvement. Modernizing merger evaluations to consider systemic risks, public welfare, and institutional strengthening, along with reforms to improve financial intermediation efficiency, strengthen creditor rights, enhance accounting standards, and facilitate information exchange, will lead to a more efficient and resilient banking sector. This study exclusively utilizes accounting performance metrics to evaluate the effect of M&A on the financial performance of acquiring banks. Nevertheless, employing alternative approaches such as the CAMELS framework, data envelopment analysis, event study methodology could yield more comprehensive conclusions over extended periods. Also, in addition to M&A, various micro- and macro-economic factors may impact the accounting performance of the acquiring firm, including cross-border acquisitions, which could also be investigated separately in future studies.

Abbreviations

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