Merger of Public Sector Banks in India: Evaluation of Financial Performance, Synergy and Prospects

An Executive Summary Submitted

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1.1. Introduction

The Indian economy post-independence had inherited a British financial system. This system largely operated through a hub and spoke model. The hub of the system had been the Reserve Bank of India and the spokes as the banks. In other words, the Indian financial system had always been bank-centric. During its growth phase, the government of India had relied largely on their banking system to channelise its development and welfare activities to reach its citizens. Hence, the banking became the key financial institution to deploy the developmental facilities of the government. Nevertheless, the banking system in India prevalent in the first two decades of post-independence were predominantly private sector. This was creating hurdles for the government of India in using these banks for its development activities. Thus, in the year 1969, the Banking Companies (Acquisition and Transfer of Undertakings) Act, 1969 was passed by the parliament to bring the major private players as government of India undertaking.

Despite the fact that this step had largely been successful to achieve its goal in bringing government programs to the citizen and deliver the developmental objectives, yet it buckled under the pressure of priority lending, development channelisation of funds which subsequently had built up the pressure of non-performing assets (NPAs) on these banks.

The early 1990s saw turbulent times in Indian economy which forced the government of India to walk on the path of liberalization, privatisation and globalisation. As an offshoot of this, large number of private banks started operating in India with enhanced zeal. The first amongst them was Unit Trust of India (now Axis Bank), followed by HDFC Bank and ICICI Bank and many more. These banks drew experience from the Public Sector Banks (PSBs) and corrected their course of actions. These banks were aggressive in their business model and were not under the similar pressure as that of the PSBs. Besides, the prioritisation of lending was largely controlled by the government of India in the PSBs making them lag behind in performance. The mounting pressure of NPAs and the large competition of the private banks necessitated drastic capital infusion for these banks.

Despite several infusion of capital and restructure of NPAs by the Reserve Bank of India, some of these banks continued to poorly perform. In order to save the interest of the investors and stakeholders, it was necessary to look for alternate options. One of such options was to

merge the poor performing PSBs with the large good performing PSBs. This resulted a) in reduction of the number of PSBs, b) increase their capital adequacy, and, c) manage the NPAs in a progressive manner.

This study takes a que from the above Indian experience and try to examine the reparations of the recent PSB mergers which happened in the year 2020 through the looking glass of synergy creation, market value addition, financial performance, and interlinkages between them.

1.2. Bank

A bank is defined as a financial organization that is permitted to take deposits and issue credits. Banks are financial service providers that offer secure currency storage. They contribute significantly to the economy by offering businesses and consumers necessary services. A bank takes on the role of a financial middleman by taking deposits and extending loans. The banking sector is vital to the economy. These organizations might also provide financial services including foreign exchange, capital management, and safe deposit boxes—often referred to as locker services. Typically, a nation's central bank or national government oversees its banks; in the case of India, this is the Reserve Bank of India (RBI), which serves as the central bank. These financial organizations provide short-term cash deposits to borrowers for longer-term loans, including business, automobiles and home mortgages. Market liquidity produced by this mechanism generates income and maintains the supply chain. The objective of any business is to generate profits for all of its stakeholders. Banks charge greater interest rates to borrowers than to account holders on loans and other obligations they issue in order to accomplish this. Banks range in size from little community banks to massive commercial banks, based on their clientele and geographic location.

1.3. Functions of a bank

Indian banks provide a diverse array of banking services. Outlined below are several key functions of banks:

Primary Functions: A bank’s primary role is to receive deposits from the general public, pool these deposits, and then allocate them as loans to individuals and businesses in need of funds. As banks offer interest on savings, it incentivizes households to save money and deposit it in bank accounts. The bank stimulates economic growth in the country by extending loans to business establishments and financing various activities.

Agency Functions: Banks act as intermediaries for their customers, carrying out various agency functions including transferring funds between branches, collecting dividends, salaries, pensions, and other regular payments on behalf of clients, making periodic rent and electricity bill payments, collecting checks, and managing clients' portfolios.

Utility Functions: These functions encompass the issuance of letters of credit, the safekeeping of valuables, important documents, and securities through the provision of secure deposit vaults or lockers, the facilitation of foreign exchange transactions for customers, the underwriting of shares and debentures, and providing guarantees on behalf of customers.

1.4. Type of banks

Banks in India are categorized into various types, each fulfilling distinct functions and objectives.

The various categories and subcategories of banks in India are explained below:

1.4.1. Central Bank: The Reserve Bank of India (RBI) is the central bank of India, founded in 1935 under the Reserve Bank of India Act (1934). Originally under private ownership, the bank was completely owned by the Indian government after it was nationalized in 1949. The Reserve Bank of India (RBI) is responsible for devising and executing the monetary policy of the government, issuing currency, overseeing international payments and foreign exchange market, serving as an investment bank for both the central and state governments and managing the financial accounts and providing credit to commercial banks.

1.4.2. Commercial Banks: Commercial banks are profit-oriented establishments that provide financial services, such as accepting deposits, providing loans, and electronic fund transfers, to their customers. These banks play a crucial role in a country's economy by meeting the financial needs of industries in the short and medium term.

Commercial banks can be categorized into the following classifications.

Public Sector Banks: These are the banks whose majority of the stake is owned by the government of India. Indian Bank, UCO Bank, Bank of Baroda, and State Bank of India are a few examples of public sector banks.

Private Sector Banks: These are the banks whose majority of the stake is owned by a private entity. Some examples of private sector banks are ICICI Bank, Yes Bank, IDBI Bank, and Bandhan Bank.

Foreign Banks: These are the banks whose headquarters are in a foreign country but have their branch in India. For example, National Australia Bank, Standard Chartered, HSBC Bank, and Qatar National Bank.

1.4.3. Payment Banks: It is a new type of bank established under the supervision of the Reserve Bank of India. It can accept deposits of up to rupees 2,00,000 per customer and can provide services like mobile banking, debit cards, and credit cards.

1.4.4. Cooperative Banks: These banks are established under the State Cooperative Societies Act and are regulated by the Reserve Bank of India. The members of these banks are its owners as well as its customers. They carry out their business through mutual understanding.

1.4.5. Specialised Banks: These banks are established with specific objectives to cater to the requirements of a particular industry or sector. They offer financial services to the industries they serve. Some examples of specialized banks are National Bank for Agriculture & Rural Development (NABARD), Export and Import Bank (EXIM Bank), and Small Industries Development Bank of India (SIDBI).

1.5. Merger and acquisition

According to the Ministry of Corporate Affairs, mergers and acquisitions are methods of achieving growth that involve a rapid increase in workforce, customers, and infrastructure resources, resulting in an overall rise in the entity's revenues and profits. Mergers involve the consolidation of two entities into one, while acquisitions occur when one entity purchases another to integrate it with itself. It can take the form of an acquisition, in which one company purchases another, or a management buyout, in which the existing management team buys the business from its owners. Mergers and acquisitions are employed as powerful means of significant expansion and are progressively being embraced by Indian enterprises as a crucial component of business strategy.

1.6. Type of mergers

The different types of mergers are explained below:

1.6.1. Vertical merger: A vertical merger is a consolidation between two companies operating within the same industry but at distinct stages of the production process. The merger is implemented to enhance synergies, achieve greater control over the supply chain process, and accelerate business growth. It also leads to cost reduction and enhanced productivity and efficiency.

1.6.2. Horizontal merger: A horizontal merger is a consolidation that takes place between companies that operate within the same industry. Such mergers occur to enhance economies of scale and achieve more efficiency. They frequently lead to the elimination of competition by consolidating two rival companies into one dominant one. Horizontal mergers can significantly enhance revenues by granting the merged companies access to a wider range of products or services.

1.6.3. Conglomerate merger: A conglomerate merger is a consolidation between companies of unrelated industries. The reasons for the occurrence of such mergers are to diversify the business, increase market share, and cross-sell products.

1.7. Bank merger

A bank merger refers to the consolidation of two banks, combining their assets and liabilities to form a single entity. Mergers facilitate financial inclusion and expand the geographic scope of banking operations. A successful bank merger has the potential to enhance the economy and enable the banks to attain recognition and a higher rating, potentially establishing themselves as a global bank.

1.8. Advantages of Bank merger

The following are few benefits of a bank merger:

i) The banks' ability to lend would be enhanced.

ii) These large financial institutions would also have the ability to compete on a global scale and enhance their operational efficiency through the reduction of their lending costs.

iii) If banks had ample funds to finance large-scale projects, the economic progress of the nation would accelerate.

iv) It would facilitate more efficient banking capital management and simplify policy execution.

v) Banks would be able to leverage the advantages of economies of scale.

vi) Enhancements can be made to the delivery of services.

vii) It will aid in managing the escalating Non-Performing Assets (NPA).

1.9. Disadvantages of Bank merger

The following are some drawbacks of a bank merger:

i) Each bank possesses a distinct culture, systems, processes, and procedures, and the merger will result in a conflict of organizational cultures.

ii) Following the bank merger in India, the stronger bank's activities will be impeded by the adverse effects of the weaker banks.

iii) Global economic crises pose a greater risk to large institutions.

iv) The management will encounter significant obstacles pertaining to branch rationalization, staff integration, and accounting synchronization.

v) If there is a high concentration of branches in a certain location following the merger, it is possible that certain branches may be shut down, leading to unemployment.

1.10. Rationale behind Bank merger

The following are some reasons for the occurrence of a bank merger:

i) To generate synergies, whereby the merged entity possesses a higher value than the sum of its original components. Synergies may arise from either cost reduction or increased revenues.

ii) Risk diversification

iii) To manage the increasing non-performing loans

iv) To establish banks with a strong worldwide presence

v) To enhance operational efficiency, accountability, and governance

vi) To establish advanced banks equipped with enhanced technologies.

vii) To augment the ability to offer credit

viii) To achieve the goal of making India a $5 trillion economy, it is necessary to enhance both market share and market penetration.

ix) To expand the customer base

x) To safeguard the interests of consumers of financially vulnerable banks

xi) Appreciation in the value of assets

1.11. Chapter Plan

The chapter plan of the study is given below

Section A

Chapter 1- Introduction to Merger of Public Sector Banks in India: Evaluation of Financial Performance, Synergy and Prospects

Chapter 2- Review of Literature

Chapter 3- Research Design

Chapter 4- Factors leading to the merger of Public Sector Banks in India

Section B

Chapter 5- Prediction of outcome and evaluation of synergy of the Public Sector Banks

Chapter 6- Effect of merger on the EVA and MVA of the Public Sector Banks

Chapter 7- Effect of merger on the CAMEL components of the Public Sector Banks

Chapter 8- Effect of CAMEL components on the EVA and MVA of the Public Sector Banks

Section C

Chapter 9- Conclusion, findings and recommendations

Bibliography

1.12. Research Questions

This section enlists the research questions that will be enquired in the study.

(i) What are the factors which led to the merger of Public Sector Banks in India?

(ii) Did the merger of Public Sector Banks lead to synergy creation of these banking entities post merger?

(iii) What are the changes observed in Economic Value Added (EVA) and Market Value Added (MVA) in pre- and post- merger window of the Public Sector Banks in India?

(iv) Did the merger succeed in improving the CAMEL (Capital Adequacy, Asset Quality, Management Efficiency, Earning Quality, Liquidity) components of the Public Sector Banks post-merger?

(v) What effect did the CAMEL have on EVA and MVA of the Public Sector Banks pre and post-merger?

1.13. Research Objectives

The following are the objectives of this research.

(i) To study the factors which led to the merger of Public Sector Banks in India.

(ii) To find out if the merger has led to the creation of synergy of the Public Sector Banks.

(iii) To find out if the merger led to a change in EVA and MVA of the Public Sector Banks.

(iv) To find out if the CAMEL components of the Public Sector Banks have improved post- merger.

(v) To understand the effect of CAMEL on the EVA and MVA of the Public Sector Banks.

1.14. Rationale

The mega-merger is the most recent and the largest merger in the history of Indian banking sector. In this event, the government of India merged ten Public Sector Banks namely, Punjab National Bank, Oriental Bank of Commerce, United Bank of India, Canara Bank, Syndicate Bank, Union Bank of India, Corporation Bank, Andhra Bank, Indian Bank and Allahabad Bank in four groups. The purpose of this merger is to build big sized banks with enhanced capacity to provide credit. They are envisioned to have strong national presence and global reach so as to form a robust banking system. The purpose of such exercise is to reach the $5 trillion economy, a mission of the government of India. The researches that have been done on the mega-merger event is empirical and descriptive in nature, giving an overview of the mega-merger event in general. This event has not been analysed using proper valuation tools in the previous studies. Therefore, by studying the mega-merger event using various tools of performance evaluation, the study contributes to the existing research.

This event has a great significance in the economic development of India and thus is chosen for the research.

1.15. Data source and Period of study

The study has used secondary source of data from RBI database. The annual reports and balance sheet of the banks, and other open data available in the internet space has been used for the study. The data for the study has enquire from the period of 2017-2023 with the window period of 2020 when the mergers took place.

1.16. Scope of the study

The research aims to analyze the mergers of different Public Sector Banks that have taken place during the period of study as a part of the mega-merger initiative that was announced by the government of India on 30th August, 2019. The merger came into effect on 1st April,

2020. This research aims to study the effect of merger on the performance of the banks, and 3 years pre and post-merger data is taken for the purpose of the study as indicated earlier.

1.17. Research hypotheses

The following are the research hypotheses

H1: There had been synergy in merger of Public Sector Banks.

H2: The EVA and MVA of the Public Sector Banks have improved post- merger

H3: The CAMEL components of the Public Sector Banks have improved post- merger.

H4: The EVA and MVA of the Public Sector Banks have been affected by the CAMEL measures.

1.18. Tools and techniques

The tools and techniques that will be implemented for this research are given below.

1.18.1. Brown and Raymond model (1986): This model is used for the purpose of prediction of the success of merger as well as valuation of synergy. This is a model designed by Keith C. Brown and Michael V. Raymond for predicting the success of M&As and it can be used to demonstrate the market's ability to discriminate between various types of acquisition proposals and predict the probability of success of the deal.

The following equation shows the Expected risk arbitrage:

$E(\pi_t) = X_t [(P_{Tt} - P_{mt})/ P_{mt}] + (1 - X_t) [(P_B - P_{mt})/ P_{mt}]$ ……. (Equation 3.1)

Where,

$E(\pi_t)$ = Expected arbitrage profit

X_t = Merger probability

P_{mt} = Prevailing market price

P_{Tt} = Tender offer price

P_B = Price if tender offer fails

$[(P_{Tt} - P_{mt})/ P_{mt}]$ is the positive returns earned by acquiring the shares at the prevailing market price P_{mt} if the takeover is successful.

$[(P_B - P_{mt})/ P_{mt}]$ is the negative returns earned by acquiring the shares at the prevailing market price P_{mt} if the takeover is unsuccessful.

By solving for equation 1, we get,

$X_t = (P_{mt} – P_B) / (P_{Tt} – P_B)$ ……. (Equation 3.2)

Here, the prices (P_{Tt}, P_{mt}) can be observed whereas the price P_B cannot be observed. Therefore, the value of P_B is estimated to be the actual market price of the target firm one, two, three and four weeks prior to the takeover announcement date.

Now that all the values are ascertained, the merger probability is calculated with the help of equation 3.2.

It should be noted that equation 3.2 is restricted to remain within (0,1) interval. When the P_{mt} is higher than P_{Tt}, the calculated probability is more than 1, but 1 is used. Similarly, when the P_{mt} is lower than P_B, the value becomes negative, but 0 is assigned as the probability.

Thus, higher the P_{mt} than P_{Tt}, higher is the probability of the takeover to be a successful one. It has been observed that the market forecast for successful takeovers never falls below 70% (0.7) and for unsuccessful takeover never rises above 50% (0.5)

For the purpose of this research, the original model given above will be used to predict the success of the merger

Where,

P_{mt} = Market price at the time of announcement of merger

P_{Tt} = Tender offer price

P_B = Market price 4 weeks prior to the date of announcement of merger.

The study required the synergy valuation model to be modified in order to study the market at the post-merger period as well so that we can ascertain both expected result and the actual result of the merger. The modified equation for synergy valuation is given below.

$E(\pi_t) = X_t [(P_{Tt} - P_{mt})/ P_{mt}] + (1 - X_t) [(P_B - P_{mt})/ P_{mt}]$ ……. (Equation 3.3)

Where,

$E(\pi_t)$ = Expected arbitrage profit

X_t = Merger probability

P_{mt} = Market price at the date of actual merger

P_{Tt} = Market price 1 year after the merger

P_B = Market price 1 year before the merger

By solving for equation 3.3, we get,

$X_t = (P_{mt} – P_B) / (P_{Tt} – P_B)$ ……. (Equation 3.4)

If the value of X_t is 0.5 (50%) or more, we assume the merger to be a successful one and if X_t is less than 0.5, we assume it to be an unsuccessful one.

1.18.2. Economic Value Added (EVA): EVA measures a company's financial performance by

deducting its cost of capital from its operating profit after making adjustment for taxes (Daru, 2016).

EVA = NOPAT – (WACC* TC) …….(equation 3.5)

where,

NOPAT = Net Operating Profit After Tax

WACC = Weighted Average Cost of Capital

TC = Total Capital

EVA as a measure has a superiority over other traditional measures. (Anil K Sharma, 2010) states that EVA estimates the true economic profit of the firm. (Abdullah Al Mamun, 2012) states that the traditional tools can explain only a specific situation, whereas EVA offers more than just one performance. Tools like EPS and NPV can only explain capital market and capital budgeting respectively, but EVA can explain capital market, capital budgeting and net asset at the same time.

1.18.3. Market Value Added (MVA): MVA is the difference of the current firm market value

and the capital contributed by investors, as of the balance sheet (Cristian Carini, 2017). It shows how much wealth the company is able to accumulate over time.

MVA = V – K ……. (equation 3.6)

where,

V = market value of the firm including firm's equity and debt

K = total capital invested in the firm

MVA is a mixed method that combines both market and account values (Cristian Carini, 2017). Bharadwaj et al. and Konar et al. suggest that standard accounting measures of performance, such as (ROA) return on assets, lack in their ability to evaluate the future profit potential of such practices. Singh (2017), Charlo (2017), Jiang (2007) are some of the researches that have considered MVA as a key variable after considering the shortcomings of traditional accounting measures.

The study has implemented Panel Regression in order to find the effect of the CAMEL components on the EVA and MVA of the banks under study.

1.18.4. CAMEL Model: CAMEL stands for Capital Adequacy, Asset Quality, Management Efficiency, Earnings Quality and Liquidity. This framework was developed in the United States in 1980s to categorize the overall condition of the bank based on five broad prospects (Pandit, 2021). This framework helped the supervisory authorities to establish a uniform assessment system that would evaluate the condition of the banks under various supervisory criteria (Reddy, 2012). The five components of CAMEL are discussed below:

i) **Capital Adequacy**: Capital Adequacy shows the ability of the bank to absorb unexpected losses and meet the requirements of additional capital without disrupting its day-to-day operations (Thisaranga, 2021). Higher Capital Adequacy prevents liquidity crisis and helps preserve the depositors' faith in the bank (Reddy, 2011), (Prasad, 2012). The ratios that measure Capital Adequacy parameter are:

A) Capital Adequacy Ratio (CAR)
B) Debt / Equity Ratio (D/E)
C) Total Advances / Total Asset Ratio (TAd/TAs)
D) Government Securities / Total Investment Ratio (GS/TI)

ii) **Asset Quality**: Asset Quality focuses on the quality of loan extended by the bank to its customers (Vijayakumar, 2012). This component analyses the composition of Non-Performing Assets in the bank's portfolio and its effect on the overall performance of the bank (Kumar et al., 2012), (Lakhtaria, 2013). The ratios that measure Asset Quality parameter are:

A) Gross NPA / Net Advances Ratio (GNPA/NAd)
B) Net NPA / Net Advances Ratio (NNPA/NAd)
C) Total Investment / Total Asset Ratio (TI/TAs)
D) Net NPA / Total Asset Ratio (NNPA/TAs)

iii) **Management Efficiency**: Management Efficiency measures the ability of the management in identifying, monitoring and curbing the risk related with the bank (Lad, 2022). This component focuses on improving the productivity of employees, setting goals for the management and implementing necessary policies to efficiently achieve these goals (Vijayakumar, 2012). The ratios that measure Management Efficiency parameter are:

A) Total Advances / Total Deposit Ratio (TAd/TD)
B) Return on Net Worth (RONW)

C) Business per Employee (B/E)

D) Profit per Employee (P/E)

iv) **Earnings Quality**: Earnings Quality shows the ability of the bank to earn progressively in the future (Lad, 2022). It displays the activities of the bank with regards to building up its future earning capabilities (Thisaranga, 2021). The ratios that measure Earnings Quality parameter are:

A) Operating Profit / Average Working Capital Fund (OP/AWCF)

B) Interest Income / Total Income (II/TI)

C) Net Interest Margin (NIM)

D) Return on Asset (ROA)

v) **Liquidity**: Liquidity measures the ability of the bank to settle its short-term debts and to meet the financial obligations of the bank to its depositors by effectively arranging cash whenever required (Pandey, 2021), (Pandit, 2021). The ratios that measure Liquidity parameter are:

A) Liquid Asset / Total Asset Ratio (LAs/TAs)

B) Government Securities / Total Asset Ratio (GS/TAs)

C) Liquid Asset / Demand Deposit Ratio (LAs/DD)

D) Liquid Asset / Total Deposit Ratio (LAs/TD)

The ratios that measure each component of the CAMEL framework is discussed with the help of the table given below:

Table 1.1: Description of the ratios that measure each component of the CAMEL framework.

COMPONENTS	RATIOS	DESCRIPTION	INTERPRETATION
Capital Adequacy	CAR	(Tier-I Capital + Tier-II Capital)/Risk Weighted Assets. Tier 1 capital includes permanent shareholders' equity; perpetual non-	It shows the capability of the bank in absorbing decent level of losses without disturbing its operations. Higher CAR shows higher protection of investors' interest and high safety against

		cumulative preference shares, Disclosed reserves and Innovative capital instruments. Tier 2 capital includes Undisclosed reserves, Revaluation reserves of fixed assets and long-term holdings of equity securities, General provisions/general loan-loss reserves; Hybrid debt capital instruments and subordinated debt.	bankruptcy.
	D/E	Total borrowings divided by shareholders' net worth.	This ratio represents the degree of leverage of a bank. Higher ratio is an indication of less protection for the depositors and creditors and vice-versa.
	TAd/TAs	Total Advances divided by Total Assets.	This ratio indicates a bank's aggressiveness in lending which ultimately produces better profitability. Higher ratio is preferred to a lower one.
	GS/TI	Government securities divided by total investment.	This ratio reflects the risk involved in a bank's investment. Higher the proportion of government securities in total investment, lower will be the risk involved in a bank's investment and vice versa.
	GNPA/NAd	Gross NPAs are	It a measure of the quality of

Asset Quality		measured as a percentage of net advances.	assets in a situation where the management has not provided for loss on NPAs. The lower the ratio, the better the quality of advances.
	NNPA/NAd	NPAs are measured as a percentage of net Advances. NPA = Gross NPAs - Net of provisions on NPAs - interest in suspense account.	It is most standard measure of assets quality. Lower ratio is preferred to a higher one.
	TI/TAs	Total investments divided by total assets of a bank.	This indicates the extent of deployment of assets in investment as against advances. Lower ratio is preferred to a higher one.
	NNPA/TAs	Net NPAs are measured as a percentage of Total Assets.	This indicates the efficiency of the bank in assessing credit risk, and to an extent, recovering the debts. Lower the ratio is better performance of the bank.
Management Effeciency	TAd/TD	Total Advances including Receivables divided by Total deposits.	This ratio measures the efficiency of the management in converting deposit available with bank in to high earning advances. Higher ratio is preferred to a lower one.
	RONW	PAT is expressed as a percentage of Average Net Worth.	It is a measure of the profitability of a bank. Higher ratio is preferred to a lower one.

	B/E	Total business divided by total number of employees. The business includes the sum of total advances, total deposits in a particular year.	It reveals the productivity and efficiency of human resources of bank. Higher the ratio, the better it is for the bank and vice versa.
	P/E	Profit after tax earned by the bank divided by the total number of employees.	This ratio shows the surplus earned per employee. The higher the ratio, higher is the efficiency of the management and vice versa.
Earnings Quality	OP/AWCF	Operating profits divided by average working funds. Average working funds are the total resources employed by a bank. It is daily average of total assets / liabilities during a year.	This ratio indicates the quantum of a bank can earn from its operations net of the operating expenses for every rupee spent on working funds. The higher the ratio, the better it is.
	II/TI	Income from lending operations expressed as a percentage of the total income generated by the bank in a year. Interest income includes income on advances, interest on deposits with the RBI, and dividend income.	It indicates the ability of the bank in generating income from its lending. The higher the ratio, the better.
	NIM	The difference between the interest income and the interest expended as	It shows ability of the bank to keep the interest on deposits low and interest on advances

		percentage of total assets.	high. A higher spread indicates the better earnings given the total assets.
	ROA	Net profit after tax divided by Total assets	It indicates how profitable a company is in relation to its total assets. Higher return on asset means greater returns earned on assets deployed by the bank.
Liquidity	LAs/TAs	Liquid Asset divided by Total Assets Liquid Assets include cash in hand, balance with the RBI, balance with other banks (both in India and abroad) and money at call and short notice. Total assets include the re-valuations of all the assets.	IT indicates the overall liquidity position of the banks.
	GS/TAs	Government securities divided by Total Assets.	Government securities are the most liquid and safe investment. It measures the risk involved in the assets held by a bank. Higher the ratio, lower is the risk involved.
	LAs/DD	Liquid assets divided by total demand deposits.	This ratio measures the ability of a bank to meet the demand from deposits in a particular year. Higher ratio shows higher liquidity for the depositors.

	LAs/TD	Liquid Assets divided by Total Deposits.	It measures the liquidity available to the depositors of a bank. Higher the ratio, higher will be the liquidity for the depositors.

Source: Refer to the Reference section.

The mean values for each ratio defining the CAMEL components are ascertained for both pre- and post-merger period. Then, the mean difference is calculated by comparing the pre-merger mean with the post-merger mean. The purpose of the mean difference is to find out if the financial performance has improved post-merger (Gandhi, 2020). After ascertaining the mean difference of each ratio for each bank, the statistical significance is tested using paired sample t-test at 5% ($\alpha = 0.05$) level of significance (Gandhi, 2020). In case the ratio is statistically significant, a score of '1' is allotted to the ratio, and if not statistically significant, it is assigned a score of '0'. Weights are allotted to each ratio based on its proportionate influence and importance in determining the financial soundness of the bank (Reddy, 2012). This is followed by ascertaining the weighted score which is calculated by multiplying the scores allotted with the weights assigned. The weighted scores of each ratio under a particular component head are totalled to attain the Cumulative Weighted Score (CWS) for each component of every bank. If the calculated CWS is 0.5 or more, the component is said to have significantly improved (Reddy, 2012). Every component of the bank is allotted an equal weight (20%) showing the equal importance of all the components for a found financial performance of a bank (Gandhi, 2020). Now that CWS for each component has been obtained, the score earned by each component is multiplied with the weights assigned to each component and totalled to ascertain the Cumulative Weighted Score of the Model (CWSM). If the calculated CWSM is 0.5 or more, the merger is said to have positively impacted the bank and has helped in significantly improving the financial performance of the bank (Reddy, 2012).

1.18.5. Panel Data Analysis: It is a combination of cross-sectional and time series analysis. It is a method of analyzing data that have been collected from different cross-sectional units for a number of time points (Bhowmik, 2015, p. 228). It provides an in-depth knowledge as it enables us to observe data from various cross-sectional units over different period of time.

A combined effect of each CAMEL component of all banks on the EVA and MVA is analyzed in this study. This can be done with the help of the models given below:

i) To find out the effect of CAMEL components on EVA:

$EVA_{ij} = \alpha + \beta_1 C1_{ij} + \beta_2 C2_{ij} + \beta_3 C3_{ij} + \beta_4 C4_{ij}$ …. (Equation 3.7)

$EVA_{ij} = \alpha + \beta_1 A1_{ij} + \beta_2 A2_{ij} + \beta_3 A3_{ij} + \beta_4 A4_{ij}$ …. (Equation 3.8)

$EVA_{ij} = \alpha + \beta_1 M1_{ij} + \beta_2 M2_{ij} + \beta_3 M3_{ij} + \beta_4 M4_{ij}$ …. (Equation 3.9)

$EVA_{ij} = \alpha + \beta_1 E1_{ij} + \beta_2 E2_{ij} + \beta_3 E3_{ij} + \beta_4 E4_{ij}$ …. (Equation 3.10)

$EVA_{ij} = \alpha + \beta_1 L1_{ij} + \beta_2 L2_{ij} + \beta_3 L3_{ij} + \beta_4 L4_{ij}$ …. (Equation 3.11)

Where,

EVA_{ij} = Economic Value Addition of Bank 'i' for the 'j^{th}' period

α = Intercept of the equation

βs = Coefficient of variables

$C1_{ij}$, $C2_{ij}$, $C3_{ij}$, $C4_{ij}$ = Ratios defining 'Capital Adequacy' component of Bank 'i' for the 'j^{th}' period where,

C1 = Capital Adequacy Ratio

C2 = Debt / Equity Ratio

C3 = Total Advances / Total Asset Ratio

C4 = Government Securities / Total Investment Ratio

$A1_{ij}$, $A2_{ij}$, $A3_{ij}$, $A4_{ij}$ = Ratios defining 'Asset Quality' component of Bank 'i' for the 'j^{th}' period where,

A1 = Gross NPA / Net Advances Ratio

A2 = Net NPA / Net Advances Ratio

A3 = Total Investment / Total Asset Ratio

A4 = Net NPA / Total Asset Ratio

$M1_{ij}$, $M2_{ij}$, $M3_{ij}$, $M4_{ij}$ = Ratios defining 'Management Efficiency' component of Bank 'i' for the 'j^{th}' period where,

M1 = Total Advances / Total Deposit Ratio

M2 = Return on Net Worth

M3 = Business per Employee

M4 = Profit per Employee

$E1_{ij}$, $E2_{ij}$, $E3_{ij}$, $E4_{ij}$ = Ratios defining 'Earnings Quality' component of Bank 'i' for the 'j^{th}' period where,

E1 = Operating Profit / Average Working Capital Fund

E2 = Interest Income / Total Income

E3 = Net Interest Margin

E4 = Return on Asset

$L1_{ij}$, $L2_{ij}$, $L3_{ij}$, $L4_{ij}$ = Ratios defining 'Liquidity' component of Bank 'i' for the 'j^{th}' period where,

L1 = Liquid Asset / Total Asset Ratio

L2 = Government Securities / Total Asset Ratio

L3 = Liquid Asset / Demand Deposit Ratio

L4 = Liquid Asset / Total Deposit Ratio

ii) To find out the effect of CAMEL components on MVA:

$MVA_{ij} = \alpha + \beta_1 C1_{ij} + \beta_2 C2_{ij} + \beta_3 C3_{ij} + \beta_4 C4_{ij}$ …. (Equation 3.12)

$MVA_{ij} = \alpha + \beta_1 A1_{ij} + \beta_2 A2_{ij} + \beta_3 A3_{ij} + \beta_4 A4_{ij}$ …. (Equation 3.13)

$MVA_{ij} = \alpha + \beta_1 M1_{ij} + \beta_2 M2_{ij} + \beta_3 M3_{ij} + \beta_4 M4_{ij}$ …. (Equation 3.14)

$MVA_{ij} = \alpha + \beta_1 E1_{ij} + \beta_2 E2_{ij} + \beta_3 E3_{ij} + \beta_4 E4_{ij}$ …. (Equation 3.15)

$MVA_{ij} = \alpha + \beta_1 L1_{ij} + \beta_2 L2_{ij} + \beta_3 L3_{ij} + \beta_4 L4_{ij}$ …. (Equation 3.16)

Where,

MVA_{ij} = Market Value Addition of Bank 'i' for the 'j^{th}' period

α = Intercept of the equation

βs = Coefficient of variables

$C1_{ij}$, $C2_{ij}$, $C3_{ij}$, $C4_{ij}$ = Ratios defining 'Capital Adequacy' component of Bank 'i' for the 'j^{th}' period where,

C1 = Capital Adequacy Ratio

C2 = Debt / Equity Ratio

C3 = Total Advances / Total Asset Ratio

C4 = Government Securities / Total Investment Ratio

$A1_{ij}$, $A2_{ij}$, $A3_{ij}$, $A4_{ij}$ = Ratios defining 'Asset Quality' component of Bank 'i' for the 'j^{th}' period where,

A1 = Gross NPA / Net Advances Ratio

A2 = Net NPA / Net Advances Ratio

A3 = Total Investment / Total Asset Ratio

A4 = Net NPA / Total Asset Ratio

$M1_{ij}$, $M2_{ij}$, $M3_{ij}$, $M4_{ij}$ = Ratios defining 'Management Efficiency' component of Bank 'i' for the 'j^{th}' period where,

M1 = Total Advances / Total Deposit Ratio

M2 = Return on Net Worth

M3 = Business per Employee

M4 = Profit per Employee

$E1_{ij}$, $E2_{ij}$, $E3_{ij}$, $E4_{ij}$ = Ratios defining 'Earnings Quality' component of Bank 'i' for the 'j^{th}' period where,

E1 = Operating Profit / Average Working Capital Fund

E2 = Interest Income / Total Income

E3 = Net Interest Margin

E4 = Return on Asset

$L1_{ij}$, $L2_{ij}$, $L3_{ij}$, $L4_{ij}$ = Ratios defining 'Liquidity' component of Bank 'i' for the 'j^{th}' period where,

L1 = Liquid Asset / Total Asset Ratio

L2 = Government Securities / Total Asset Ratio

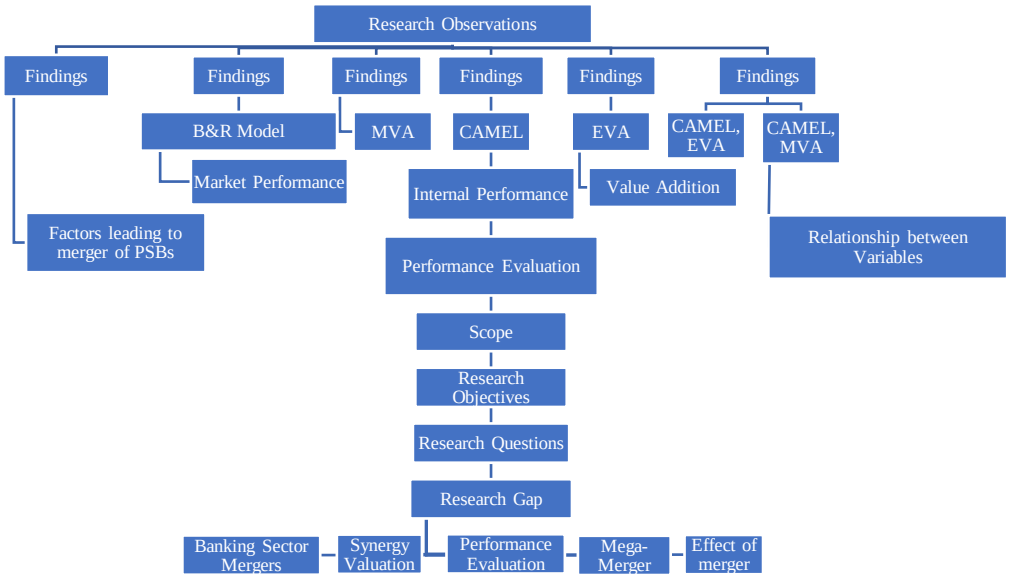
L3 = Liquid Asset / Demand Deposit Ratio

L4 = Liquid Asset / Total Deposit Rati

The values of all the variables are calculated at the end of each financial year.

The research can be explained with the help of the research tree given below in Figure 1.1.

Figure 1.1: Research Tree



Source: Constructed by the author

The research commenced by reviewing the literatures on banking sector mergers, synergy valuation techniques, performance evaluation tools, and effect of merger on the organisations. This process of reviewing the literatures helped in identifying the gap in the research. The research gap led to the formation of research questions which led to creation of research objectives and scope. The research is categorised into three parts. The first part deals with understanding the factors leading to the merger of Public Sector Banks in India. The second part deals with the evaluation of performance of the banks under study. The performance evaluation includes market performance (as measured by Brown and Raymond Model, and Market Value Addition), internal performance (as measured by CAMEL model), and value addition (as measured by Economic Value Added). The third part deals with understanding the relationship between Economic Value Added and CAMEL components, and Market Value Addition and CAMEL components. Finally, after ascertaining the findings, research observations have been drawn.

1.19. Survey of literature

This section deals with the literature of the research carried out in the field of mergers and in particular the merger of the banks. It also deals with the literature on the mergers of Indian public sector banks.

Paul and Majumdar (2020) state that in the banking sector, achieving economies of scale is the primary driver of mergers and acquisitions. Additionally, mergers aid in product diversification, which lowers risk. The suggestions of the Narasimham Committee II have sparked mergers and acquisitions in the Indian banking sector. A merger of strong banks and financial institutions would be more sensible from an economic and commercial standpoint, demonstrate the principle that one combined entity is greater than the sum of its parts, and have a "force multiplier effect" according to the committee's recommendation.

Kumar, Agarwal and Garg (2021) state the primary reasons for bank mergers in India are to promote economic expansion, create fewer, better, larger international lenders, lessen unfair business practices and unfair competition among public sector banks, reach the goal of turning India's economy into a $5 trillion economy, and better target defaulters. A wide range of financial sources were available to many people. They can live under fewer roofs after a merger, which speeds up healing.

Poornima, Priya, Mathew and Rajeswari (2023) outline the different ways that a merger event can help the banks. It claims that with the massive merger of public sector banks, the combined businesses may now take advantage of synergy, particularly when it comes to network branches that span multiple areas. For instance, the United Bank of India, which has a significant presence in the Eastern region, now gains access to Punjab National Bank's larger branch network, which, before the merger, spanned the entire country's north and centre. Similar to this, Indian Bank is now able to expand its reach through central and eastern regions, with a strong presence in the southwest, owing to an affiliation with Allahabad Bank. It argues that following PSB mergers, lending capacity will increase and their financial position will also develop in the post-merger period; PSBs will be able to expand internationally and increase their operational efficiency; the PSB merging process will also contribute to the development of the Indian economy; the use of technology will also advance in this regard.

Kumar and Upadhyay (2022) determine whether mergers and acquisitions in the Indian banking industry result in improved financial performance. To explain the differences between pre-and post-merger accounting ratios, a descriptive research design was used as the research methodology. The study examined data from 2010 to 2018, taking into account the following financial metrics: loan-to-asset ratio, net interest margin, return on equity, capital adequacy ratio, and return on asset. In comparison to the pre-merger period, the analysis and findings demonstrate that banking companies did not do well in the post-merger period.

Tripathi (2022) examines the impact of mergers on Indian banks. Four private sector banks and fourteen public sector banks were taken into consideration for this reason, and a cross-sectional analysis (before and post-merger) was carried out. The results show that large banks can more easily compete globally after a merger, that the cost of banking operations decreases, NPA and risk management can be improved, the merger offers a better efficiency ratio for business and banking operations, that risk is minimized, profitability is increased, failing banks can survive, financial inclusion and geographic reach can be expanded, and the short- and long-term liquidity can be better managed.

Kaur and Singh (2016) examine the post-merger results of eleven bank merger instances for ten years. Eight variables—Branches, Employees, Advances per Employee, Income, Deposits per Employee, Income per Branch, Income per Employee, and ROA—are used to compare the pre-post performance. This paper's analysis demonstrates that banks should merge within

the same industry, as most mergers within that industry have been successful. With a few exceptions, the analysis reveals that most of the variables under investigation aside from ROA have significantly improved in the accounts of the acquiring banks following mergers.

Srinivas (2011) outlines the many objectives that an organization has for implementing merger activities. Among the objectives are corporate development and expansion, market penetration, diversification, tax savings, and other synergistic advantages. The pattern of merger and acquisition activity in India is also examined in the research.

Mogla and Kakkar (2020) examine the operating matrices of the banks that combined as part of the mega-merger plan, which resulted in the consolidation of 10 public sector banks into four. The post-merger phase has changed favourably, according to the matrix. Along with a decrease in non-performing assets and an increase in profitability, public sector banks have demonstrated improved credit growth.

Reddy (2020) lists the key motivations for bank mergers. The primary motivations behind bank mergers in India are to reduce unfavourable competition among public sector banks, establish a smaller, more powerful global lender base in an effort to support economic expansion, and move toward realizing the goal of turning India into a $5 trillion economy. Additionally, it offers the banks' post-merger operational matrices in detail.

Kambar (2019) examines a few mergers in India's public sector banks and outlines several benefits of bank mergers. Mergers save operating costs for banks and enable geographically dispersed, regionally confined banks to reach new markets. Big banks would enable greater control of the RBI over the banks, access to a larger customer base, a wider capital base that would allow them to offer higher loans, and superior human resource management.

Ishwarya (2019) analyses the merger of State Bank of India and its Associates, and presents a number of justifications for bank mergers. A merger can increase risk diversification, create economies of scale, facilitate the transfer of skills between the two banks, making them better and more competitive, and improve technology and services.

Ravi (2019) states that the success or failure of a company's merger and acquisition efforts is largely dependent on its planning and strategy. Adopting the idea of a merger and acquisition may also be a risky process because it could cause the company to have a number of issues with management, operations, etc. Overall, though, the idea is undoubtedly boosting the economy, particularly in the local and international banking industries.

Meena and Kumar (2014) review the patterns in M&A activity and the resulting effects on the Indian banking sector. The report accesses the M&A performance in the Indian banking industry between 2000 and 2013. With the use of financial metrics including net profit margin, earnings per share, return on equity, operating profit margin, return on capital employed, dividend per share, capital adequacy ratio, etc., the study examines the pre- and post-merger financial performance of the combined institutions. The results imply that M&A has been somewhat successful in the Indian banking industry.

Malhotra and Bhartiya (2014) focus at how banks perform following an acquisition. Analysis of operating earnings has been done for public and private sector banks of India. Operating profit margins grew in the post-merger period, although return on net worth and capital employed marginally decreased, according to the findings of the examination of the acquiring banks' pre- and post-merger operational performance ratios. There are sixteen banks in the sample. Three years prior to and following the acquisition, data from the Prowess database was gathered. The findings indicate that the majority of banks fared well during the post-merger phase.

Patel (2021) measures the profitability, liquidity, and credit management of certain banks. It also studies the financial performance of prospective mergers and post-mergers in the public baking sector, and derives the required conclusions.

Basavaraj (2019) offers a chronological overview of bank mergers that were nationalized and includes quantitative data at each stage of the merger process. At a time when the nation's GDP is declining and the banking system is at a crossroads because of growing non-performing assets (NPAs), rising fraud, and collapsing banks, the government decided to massively consolidate nationalized institutions. The benefits and drawbacks of bank mergers are discussed in the study. It notes that a merger does not ensure that banking organizations will not experience difficulties in the future. A bank's size alone won't help it unless it increases lending and concentrates on recovering bad debts.

Brown and Raymond (1986) put forth a model to forecast M&A success and used it to show how the market can distinguish between different kinds of acquisition offers and forecast the likelihood that the agreements will be successful. It says that successful takeovers can be distinguished from unsuccessful ones by the market. According to the model, for a successful takeover, the merger probability for the 12-week prior merger period never goes below 0.7, and for takeovers that are failed, the merger probability never goes above 0.5.

Samuelson and Rosenthal (1986) look at changes in the target company's stock price to forecast if the tender bids will ultimately succeed or fail. It examined 100% cash tender proposals from 1976 to 1981 for this reason. The study shows that, with a few notable exceptions, we can determine the anticipated stock price at the conclusion date by observing the target firm's stock price movement during the tender offer period.

Hutson (2000) offers an alternative approach to Brown, Raymond, and Samuelson and explain how the target share pricing procedure is determined by the likelihood that the takeover attempt will be successful. It uses 245 Australian takeovers between 1980 and 1993 to apply the approach. The takeover targets' excess returns prompt inquiries about the effectiveness of the corporate control market. The bid price showed significant non-convergence for the targets of winning bids. This is in line with speculative trading models, which state that market liquidity evaporates when traders' beliefs become less dispersed.

Branch and Yang (2003) explore the likelihood of a merger's success or completion for the years 1991 to 2001. It tests how payment methods and merger types can affect the success of three common takeover offer types: cash tender, stock swap, and collar. It also builds a prediction model for merger completion. The results of the multivariate test show that takeover bids that give cash have a higher chance of success than those that offer stock as payment. It makes the case that the stock payment method's implicitly ambiguous equity values explain why the success rate is lower. When compared to a fixed exchange ratio, a range of exchange ratios (collar offers) typically increases the likelihood of success. Furthermore, it is discovered that the risk-adjusted returns of risk arbitrage and similar strategies can be raised by applying our prediction model, which is based on both recent and historical data.

Leepsa and Mishra (2017) employed logistic regression to determine the likelihood that Indian manufacturing enterprises would succeed or fail following mergers and acquisitions. The analysis covered M&A transactions from 1997 to 2011 and ran from 2000 to 2008. The study's independent variables included mergers and acquisitions experience, acquirer size, pre-merger current ratio, return on asset, quick ratio, net profit margin, return on capital employed, return on net worth, asset turnover ratio, and interest coverage ratio. The rate of EVA (economic value added), which is thought to be a better indicator of performance, served as the dependent variable. According to the study, a given firm's chances of succeeding after M&A rose when its pre-M&A fast ratio and asset turnover ratio rose and its

pre-M&A current ratio and net profit margin declined. Additionally, it was calculated that in the case of M&A, a business with a Z score below 0.02 would most likely be heading for failure, whilst those with a score above 0.02 were more likely to succeed.

Wang, Charifzadeh and Herberger (2020) examine the reaction of purchasing companies' stock returns to the announcement date in cross-border mergers and acquisitions (M&A) involving German targets and listed Chinese acquirers. Utilizing an event research approach, it investigates the impact of shareholder value on a sample of mergers and acquisitions from the most recent time of 2012 to 2018. The findings show that, over a five-day symmetric event window, Chinese acquirers' shareholders receive a positive cumulative anomalous return of 2.18% upon the announcement of M&A involving German targets. In addition, the research discovered hints of potential information leakage before the official declaration. This analysis indicates that Chinese acquirers' shareholders benefit more from abnormal returns when the German targets are non-listed enterprises, even if it does not always show a correlation between the size of acquiring firms and positive abnormal returns in the short run.

Datta, Kodwani and Viney (2013) analyse the sample of 156 M&A instances involving utility sectors in Europe between 1990 and 2006 yielded data on the performance of utility sectors after M&A. The results indicate that the shareholders of the acquiring corporations experience reduced levels of loss. Utility investors receive an unfavourable indication when the acquirer's investors experience short-term losses and the combined post-acquisition companies' investors experience long-term losses.

Mantravadi and Reddy (2008) has investigated the effect of different types of mergers and acquisitions on the operating performance of acquiring or the merging corporates in India. It examines various pre- and post-merger financial ratios in a selection of firms including all mergers through public limited and traded organizations in the period of 1991-2003, The findings imply that there are only slight differences in the effects of different types of mergers on operating performance.

Leepsa and Mishra (2012) look at how profitability, liquidity, and solvency have changed since the merger compared to pre-merger performance. The study's focus is solely on Indian manufacturing enterprises. Descriptive statistics and the paired sample t-test are the statistical methods employed. The results indicate a statistically insignificant improvement in the liquidity ratios following the merger. Regarding the leverage ratios, there has been a drop in the debt ratio and an increase in the interest coverage ratio following the merger;

nevertheless, these changes are not statistically significant. The post-merger period has seen an increase in the profitability ratios. For Return on Net Worth and Return on Capital Employed, it is statistically significant.

Poddar (2019) assesses the influence of the acquiring firms' financial performance both before and after. This will be accomplished by utilizing select financial ratios and a paired t test at 5% significance to compare the acquiring company's pre- and post-merger performance in a subset of M&A transactions in India over the years 2007–2008 and 2012–2013. The study's conclusions show that the acquiring company looks to have received less value from the entire M&A transaction than anticipated. This could be due to a variety of things, such as the macroeconomic climate and the acquirer company's motivations for the merger. The global financial crisis looks to be one of the main reasons limiting the performance of the Indian acquirer corporations.

Loukianova, Nikulin and Vedernikov (2017) look for the best course of action for investments in a liberalized worldwide energy market where the cost of energy is fixed and all other factors are set up differently for each nation. Using the real choices theory, the analysis takes into account the variables of investment time and power price in wind energy. It builds a model for investment analysis in this entrepreneurial area and chooses a range of data for the wind energy industry from various nations across multiple continents.

Gandhi, Chhajer and Mehta (2020) examine and contrasts the post-merger financial results of banks in the public and private sectors. According to the study, both public and private sector banks have independently demonstrated improved financial performance following mergers in relation to a few CAMEL model criteria. Nevertheless, the banks' post-merger financial performance has not improved statistically significantly overall. When comparing the financial performance of private sector banks post-merger to that of public sector banks, there is also no discernible difference.

Reddy and Prasad (2011) make an effort to discuss about the post-reorganization financial performance of a few chosen regional rural banks. the banks under study are Andhra Pragathi Grameena bank and Sapthagiri Grameena bank. The CAMEL Model has been used to assess the financial soundness of the sample banks, and the required comparative analysis has been conducted.

Vijayakumar (2012) examine SBI and ICICI's performance from 2000–01 to 2004–05 using the CAMEL Model. It is discovered that when it comes to capital adequacy, SBI outperforms

ICICI. But in terms of income quality, management quality, and asset quality, the opposite is true. Both banks have a solid liquidity position that does not differ much.

Betzer, Doumet and Goergen (2015) examine the 1989–2008 accounting and stock performance of 4547 US acquisitions. Based on the four conceivable combinations of positive or negative anomalous stock performance and abnormal financial performance, the acquisitions are divided into four categories. It began by contrasting the features of the bidder, bid, and target in each of the four purchase categories. Then, notable variations were discovered. Second, the research explains these variations in bidder, bid, and target features by variations in the acquisition incentives with the aid of pre-existing theories.

Jakub, Viera, and Eva (2015), EVA establishes a single reference rate for all of the company's activities, including financial and investment ventures, as well as the performance standards for the business and the efficacy of its financial structure. The process of globalization and the growth of international trade are progressively imposing uniform accounting standards as well as a common theoretical and methodological framework for evaluating the various facets of the business and its activities.

Altaf (2016) tests the assertion stated by Stern Stewart & Company that economic value added is a more useful metric for describing market value than conventional earning-based measurements. A sample of 325 Indian businesses has been split into two sections for easier explanation: 170 businesses are from the manufacturing sector and 155 are from the service sector. The study findings indicate that there is a significant correlation between operating income and market value added in both the service and manufacturing industries, based on the results of univariate and multivariate regression analysis. The market value added and the economic value added for both sectors have a positive but weaker relationship.

Mahesh (2016) examines how EVA has surpassed traditional metrics as a more useful instrument for gauging financial success. The issues with profit measuring tools include that they fail to account for the cost of equity capital, are susceptible to manipulation by accountants, and are not accurately reflecting the wealth that has been created. A performance evaluation approach called Economic Value Added seeks to address these two shortcomings. A measure of a business's financial success called economic value added (EVA) is derived from residual wealth, which is determined by subtracting the cost of capital from operating profit and then cash basis adjusted for taxes. It aims to identify the actual economic profit of the company.

Costin (2017) enumerates the drawbacks of several conventional measurement instruments. Ignoring the cost of the money spent will enhance return on investment (ROI). It is possible for there to be a non-alignment with an increase in shareholder return when there is ROI since the erroneous use of capital is not represented. The rise in leverage caused by taking on more debt is not taken into account by return on equity (ROE). In this instance, maximizing ROE may mean lowering or even risking the shareholder return by raising the risk associated with leverage. As long as it is close to the marginal cost of debt, earnings per share (EPS), regardless of whether it is stock or debt, responds strongly to additional capital invested. Real shareholder return may rise without corresponding changes in EPS.

Apreku, Ahiale, Ameyaw, Owusu, and Apreku (2022) state that there are three reasons why traditional performance measurements are criticized for failing to provide strategic decision-makers adequate guidance: first, they ignore the cost of capital that must be invested in order to turn a profit. Second, the aggregate nature of typical performance assessments makes it difficult to characterize the impact of various strategic components. Critics of these performance measurements point out that they cannot identify the reasons behind a company's high or low performance, which leads to the third argument. In order to remedy these shortcomings, value-based metrics were created. The main driver behind the adoption of value-based performance evaluations is the necessity of using efficient tools that can evaluate actual value creation if a company's main objective is to raise the wealth of its investors.

GS and Rahmansyah (2017), financial statements serve as a standard for investors when evaluating the success of the organization. Investors aren't always given precise information about the company's financial statements, and there are questions about how fair they are. It is insufficient to analyse financial statements using financial ratios. Alternative methods for analysing financial statements that take into account the performance of the real company can be required by the investors. As a result, market value added (MVA) and economic value added (EVA) studies are available to both investors and potential investors. By using these basic assessments, investors may determine whether a company has value added or not and how well it is performing where they are investing.

Choong (2021) evaluates the relationship between EVA and MVA in generating shareholders' value. The performance of 476 publicly traded companies in Bursa Malaysia has been examined in this study. The businesses span ten years of data (2007-2016) in eight sectors.

The results appear to indicate a noteworthy correlation between EVA and MVA for companies based in Malaysia.

Novyarni and Ningsih (2020) compare the performance of a company using financial ratios and EVA. The performance of PT. Garuda Indonesia Tbk, which is listed on the Indonesia Stock Exchange, is examined in this study from 2013 to 2017. Although there are still some ratio fluctuations, the study's findings indicated that PT. Garuda Indonesia Tbk's overall financial ratio from 2013 to 2017 indicates that the company's financial performance was fairly strong. On the other hand, the Economic Value Added (EVA) technique of evaluating financial performance yields a negative result, indicating that the company is not able to generate further value for its shareholders.

Firasati (2020) compares the profitability of telecommunications businesses listed on the Indonesia Stock Exchange (IDX) from 2013 to 2018 based on Economic Value Added (EVA), and drew necessary results.

Balachandar and Sivakumar (2016) determine whether, in the Indian context, firms that have implemented EVA outperform comparable enterprises that have not. The current study is a comparative examination of the financial performance of EVA and non-EVA enterprises using 10 years financial data of a sample of 42 firms (21 EVA and non-EVA firms each). The study's findings demonstrate that, on a case-by-case basis, EVA firms outperform non-EVA firms on a number of financial metrics. On the other hand, EVA companies do not outperform non-EVA companies on a consolidated basis, particularly when it comes to profitability. Thus, the research comes to the conclusion that, in the Indian context, EVA is not considered a significant driver of profitability.

Nakhaei (2016) tests the idea that market value added (MVA) has a stronger correlation with stock return (SR) than conventional performance indicators. 395 non-financial companies that were listed between 2002 and 2011 on Bursa Malaysia's main market were included in the sample. Regression analysis using panel data was used to examine the hypotheses. The findings showed that, in comparison to MVA, accounting metrics (NI, NOPAT, and EPS) have a greater relative information content with stock return. Therefore, the hypothesis that MVA is better to traditional accounting metrics in association with stock return is not supported by the results.

Bhasin (2017) explains the idea of Economic Value Added (EVA), which is becoming more and more popular in India. It investigates if EVA is a better performance metric for internal

governance and corporate disclosure. Indian businesses have recently begun emphasizing the development of shareholders' wealth by implementing value-based models for calculating shareholder value, which aid in coordinating managerial choices with business objectives.

Shishany, Al-Omush, and Guermat (2020) compare the performance of 89 US companies that used EVA as a compensation system to that of a subset of matched firms, market indices, and the S&P 500 portfolio. Subsequently, it employs the CAR and BHAR techniques, two popular aggregating approaches, to test the event of various US corporations adopting EVA. Nonetheless, the outcomes demonstrated a marginal enhancement in the operational efficiency of businesses that implemented EVA during five years following the adoption date.

Wang, Jiang, and Liu (2016) examined the variables influencing financial early warning systems in industrialized and developing nations using data from 2003 to 2013 and a logistic model. Based on the data, it can be concluded that EVA is a better predictor of bank failure in the G20, ASEAN, EU, NIC, and NAFTA countries. The EVA can be used to stop wasteful money management (i.e., income in excess of cost) and guarantee that businesses do not waste resources. It is likely to represent an enterprise's true economic value. As a result, bank failure forecast accuracy has risen. Furthermore, in many nations, the EVA may be the best indicator for predicting bank collapse.

Silvia and Wangka (2022) use the Market Value Added (MVA) and Economic Value Added (EVA) methods to evaluate the financial performance of product distributors. Throughout 2018 and 2019, assessments were made on product distributors by looking at quarterly financial reports. To determine the MVA and EVA values, descriptive statistical analysis was employed. Even though the company is a fresh start-up, the analysis of financial performance using the EVA and MVA methodologies yields a positive value, indicating that the company can provide extra economic value for its investors.

Alsoboa (2017) compares the Return on Assets (ROA) for the years 2011–2015 to discuss the relationship between Economic Value Added (EVA) and Created Shareholders Value (CSV) in Jordanian public industrial businesses (JPIF). The paper also discusses the potential advantages of EVA over ROA by elucidating the variations in CSV for JPIF. The Fernandez model and the market value added model are the two models used in this study to measure CSV. In the investigation, simple and multiple regressions were employed. Overall, these investigations have demonstrated that EVA's superiority over ROA in predicting and assessing the CSV may be definitively and favourably viewed. Nevertheless, the findings

indicated that measuring a firm's performance or CSV using a single financial metric is insufficient. As a result, this study strongly advises JPIF to employ a variety of metrics, particularly contemporary indicators, when determining and analysing their performance and worth.

Panigrahi (2017) looked into the relationships between shareholder wealth and performance measuring methods in the context of publicly traded construction enterprises in Malaysia. Panel data analysis techniques were employed in the study, namely panel Ordinary Least Square (OLS) regression to test the hypothesis and Error Correction Models (ECM) to examine the association of error terms. The findings unequivocally validate the conclusions drawn from earlier research on the significance of earnings per share, economic value added (EVA), and dividend pay-out ratio. They also provide more evidence for the performance metric's potential utility in assessing both internal and external performance. Additionally, it is discovered that there is a negative correlation between market value added (MVA) and generated shareholder value (CSV), defying the idea that established that shareholder value increases in response to stock market value and efficiency increase.

Mamun and Mansor (2012) aimed to determine the benefits of using EVA as a financial performance metric instead of traditional metrics, as well as any advantages or additional value that EVA has over traditional approaches. Due to its capacity to accurately represent a company's profitability, EVA has drawn the interest of major corporations such as Coca-Cola, Sprint Corporation, and Quaker Oats. That being said, relatively little research has been done on EVA in Asian nations, including Malaysia.

Saputro, Nurani, and Hayatie (2021) ascertain financial performance of PT Darma Henwa Tbk's from 2017 to 2019. This study's analysis made use of the Economic Value Added (EVA) approach. According to the research findings of PT. Darma Henwa Tbk., 2017 has a favourable value. In the meantime, EVA's worth rose in 2018. Nevertheless, the EVA value dropped and ended up being negative in 2019.

Sura and Lather (2013) compare the EVA and conventional matrices. The study's fourteen-year financial reference period runs from 2000 to 2013. For examining the relative and incremental informative value of EVA in comparison to other conventional financial performance metrics, the multiple regression and Biddle et al. (1997), Bao and Bao (1998) approaches are chosen. According to the cross-section regression result, earning (PAT) has a higher explanatory ability to describe market value contributed by sample banks than do

EVA, ROI, and EPS. Fourth, compared to EVA, ROI, EPS, and ROCE alone, PAT has the strongest relative explanatory ability to describe market value added, and EVA's relative informative content is lower than PAT's to explain market value added, according to the relative and incremental informational tests.

Kumar and Sharma (2011) investigate the assertions made by proponents of economic value added (EVA) that their metric is superior to five other traditional performance measures used in the Indian manufacturing sector: net operating profit after tax (NOPAT), cash flow from operations (OCF), earnings per share (EPS), return on capital employed (ROCE), and return on equity (ROE). They also present empirical data to support their claims. In order to do this, tests and analyses are conducted on the relative and incremental information content of different performance measures and their correlation with market value added (MVA). The findings show that while EPS has a negative loading, variables like NOPAT, OCF, ROE, ROCE, and EVA have the greatest impact on the market value (MVA) of the sample companies. Furthermore, NOPAT, according to the PCA loading matrix reveals that NOPAT, OCF, ROE and ROCE perform better than EVA.

Lehn and Makhija (1996) enumerate the many benefits of MVA and EVA. Some suggest using EVA and MVA as metrics for CEO remuneration plans and corporate strategy development, in addition to their usage as performance measurements. Since they take into consideration the riskiness of a company's operations and the cost of capital, EVA and MVA are better indicators of value creation than accounting profits. Still, practical advantage does not necessarily follow from conceptual supremacy.

Kurmi and Rakshit (2017) attempt to determine whether EVA can be a preferred financial performance measure for investors in evaluating company performance while designing investment strategies to scan the information content of EVA and the traditional financial performance measures (ROA, ROCE, ROE, and EPS) in explaining variations in stock returns. Here, the problem has been tackled using both the incremental information content test approach and the relative information content test. This study uses 50 Indian companies that were listed on the Bombay Stock Exchange between April 1, 2006, and March 31, 2016 as a sample. The results indicate that EVA has the highest value significance of information power to explain changes in the stock return, followed by ROA, EPS, ROE, and ROCE in order. EVA significantly increases the illustrative power of conventional performance metrics, as revealed by the incremental information content test.

Babatunde and Evuebie (2017) look into how Nigerian stock returns are affected by economic value added. A sample of 60 firms that were quoted on the Nigeria Stock Exchange (NSE) between 2004 and 2015 was used for this study. It was noted that EVA and stock returns were related. At the 0.05 level, the OLS regression analysis's findings were statistically significant. Additionally, the F Statistics of 1.036 demonstrate that the outcome generally explained the model. Additionally, a strong positive link between EVA and Nigerian stock returns is indicated by the correlation coefficient. The study's conclusions supported the idea that EVA boosts stock returns in Nigeria.

Jankalová and Kurotová (2019) use a case study to demonstrate the worth of the company by applying the Economic Value Added technique to actual corporate data. It claims that the Economic Value Added approach seems to be a good fit for characterizing the financial status of businesses and determining their true economic profit.

Ali (2018) ascertains the impact of market and economic value added on the corporate value of manufacturing firms in the consumer products sector that are listed on Indonesian stock exchanges between 2011 and 2014. Ten consumer products manufacturing companies registered on Indonesian stock exchanges served as the research sample. The strategy employed was purposive sampling. Confirmatory factor analysis was utilized in this study to create a combined proxy of corporate value that included Tobin's Q, price to book value, and price earnings ratio. Corporate value (PER, PBV, and Tobin's Q) was not significantly impacted by EVA, meaning that a rise in corporate EVA did not ensure an increase in corporate value, and vice versa. Nonetheless, based on the analysis's findings, it was established that while MVA had a negligible impact on PBV, it had no discernible effect on Corporate Value. This demonstrated that, while a company's MVA value may rise, there is no assurance that the corporate value—which includes PER, PBV, and Tobin's Q—will follow suit, and vice versa.

Panigrahi, Zainuddin, and Azizan (2014) looked into how shareholder wealth maximization was affected by management choices for capital structure, dividend policies, compensation, credit policies, and investments. The purpose of the document was to improve communication and understanding between the company's management and shareholders. Portfolio theory, the capital asset pricing model, and contemporary financial theory all provide evidence on the relationship between management choices and shareholder value in order to accomplish the goal. The argument posits that the shareholders' primary concerns are

the value of the company's shares and the quantity of dividends paid. Thus, managers must develop their abilities and skills to surpass organizational goals in order to satisfy the demands of the company's owners.

Marvadi (2017) looks at the effects of value-based metrics in order to determine which value-based measure contributes the most to the creation of shareholder value in the Indian banking sector. The analysis is based on panel data from 36 banks in total, 22 of which are in the public sector and 14 of which are in the private sector, covering the years 2004–2005 through 2014–2014.The study's findings show that, when compared to MVA and CVA, EVA contributes the most to value creation and has a very strong association with it.

Masyiyan and Isynuwardhana (2020) assess the financial performance of coal subsector mining businesses listed on the Indonesia Stock Exchange between 2014 and 2018 using the EVA (Economic Value Added), MVA (Market Value Added), and FVA (Financial Value Added) techniques. Six firms with share codes of BYAN, DOID, ITMG, PTBA, SMMT, and TOBA that have positive EVA values during the last five years are the study's EVA results. Then, some MVA results from this study have a tendency to be negative. Over a five-year period, three companies with the stock codes DOID, ITMG, and PTRO have negative MVA values annually. Subsequently, regarding the FVA value produced by this investigation, three companies—those having the stock codes DOID, KKGI, and PTRO—had a negative FVA value annually during the study period.

Chen and Dodd (1997) enlist the main causes of EVA's unexpected popularity. It says that companies like AT&T and Coca-Cola seem to be among EVA's formidable army of corporate backers. These companies' executives have expressed the satisfaction they are with their new measurement system. The corporation openly expresses its expectation that EVA will raise its stock prices to all-time highs.

Vasilescu and Popa (2011) enumerate the drawbacks of the conventional performance assessment instruments. It claims that various formulas, such as Return on Assets, Return on Investment, Return on Equity, Return on Resources Consumed, etc., are typically employed to calculate rates of return in order to assess performance. These rates' primary flaw is that, in every situation, boosting profits does not equate to maximizing shareholder wealth.

Dhiman and Pruthi (2012) make an effort to identify the businesses that either create or destroy wealth for their owners. The study's primary goal is to rank the companies according to their EVA. Because only three of the fifty companies in our sample have disclosed

Economic Value Added in their annual reports, a sample of fifty companies from the NSE listed companies for the period of 2005-2010 from the stock market have been selected and ranked according to EVA as wealth creating or wealth destroying companies. In order to help shareholders decide whether to keep investing in the same company or not, this paper primarily focuses on their benefits.

Visaltanachoti, Luo, and Yi (2008) revisit the advantages of EVA by contrasting the information content of EVA with those of three conventional accounting-based performance measures—cash flow from operations (CFO), earnings (EBIT), and residual income (RI). Results indicate that there is a stronger correlation between sector returns and traditional accounting performance indicators than there is with EVA.

Tsuji (2006) assesses the usefulness of Economic worth Added (EVA), a statistic that is being utilized more frequently in Japan to gauge business worth. From the perspective of both levels and fluctuations, EVA is contrasted with a number of other valuation metrics, such as cash flow, operational income, and profit after tax. The Weighted Cost of Capital (WACC) from the Capital Asset Pricing Model (CAPM) and the WACC from the Fama–French (1993) model are also used to analyse two distinct forms of EVA. The findings show that corporate market values—both their levels and fluctuations—have more of an impact on cash flow and other metrics of earnings than do EVAs.

Tortella and Brusco (2003) tested the market's response to the implementation of the Economic Value Added management strategy using several event case study methodologies and test data. It also examines the evolution of three sets of firm variables—profitability, investment, and cash flow variables—before and after EVA adoption, analysing the effects on the primary company variables. It has been noted that the market does not seem to respond to the adoption of EVA. Businesses then implement EVA over an extended period of subpar performance, and performance metrics only start to improve over time following EVA implementation. The adoption of EVA encourages managers to make more investments for the company, and this seems to be associated with larger debt levels. Lastly, the implementation of EVA has a favourable and substantial impact on cash flow metrics.

Sparling and Turvey (2003) revaluated the data and problems related to the use of EVA as a tool for investment valuation in addition to revisiting the connection between EVA and shareholder return. The study investigates two possible correlations for each of the 33 food companies featured in the database using the Stern Stewart Fortune 1000 data. The first

compares shareholder returns over three, five, and ten years to the absolute level of EVA in 2000. The second comparison is between shareholder returns and the mean percentage increases in EVA over the course of three, five, and ten years. In every case that was examined, the relationships were determined to be incredibly weak.

Parvaei and Farhadi (2013) look at the firm's and management's primary performance metrics, net income (NI), residual income (RI), economic value added (EVA), and free cash flow (FCF), to see if EVA is more effective than other metrics at assessing the firm's success. The predictability of Economic Value Added for future performance is then examined. Measures with incremental information content and relevant information content are used. The findings indicate that, when combined with other metrics, EVA is the most effective way to assess a company's and management's performance. In addition, as compared to other measures, FCF has marginally better prediction while EVA has poor predictability for performance.

Palliam (2006) tests this claim that Economic value added (EVA) is s more strongly correlated with stock returns and firm valuations than accrual earnings, and assesses whether aspects of EVA are responsible for these correlations. 75 EVA users and thirty-three non-EVA users were chosen at random. Revenues, profits, assets, equity held by stockholders, market value, earnings per share, total return to investors, and percentage of cost reduction over time were the variables used in this study. Data were gathered using a number of metrics. According to the study, there is no guarantee that metrics computed for EVA users that are often utilized by analysts are better than those computed for non-EVA users.

Kaur and Narang's (2009) test whether traditional performance measurements and value-based measures are equally associated with MVA. The market appears to be more focused on "Profits" than value-based measures like Economic Value Added (EVA), according to the current study, which makes use of the methods of Univariate Regression Analysis, Multivariate Regression Analysis, and numerous test statistics. Regarding Univariate analysis, the data indicates that even though PAT and EVA show a highly positive and significant association with MVA, PAT's explanatory power is up to double that of EVA. When compared to EVA, ROCE and ROTA also show a somewhat greater correlation with MVA. The main conclusions of the multivariate study support the previous claim that Earnings have a higher relative information richness than EVA.

Feltham, Issac, Mbagwu, and Vaidyanathan (2004) investigated whether stock returns were more strongly correlated with reported earnings than with EVA. The analysis's findings are consistent with the idea that EVA explains market-adjusted stock returns more effectively than profits.

De Wet (2005) uses market value added (MVA) as a stand-in for shareholder value when analysing the performance of businesses listed on the JSE Securities Exchange South Africa. The results refute the argument that EVA is superior. Stronger correlations between MVA and operating cash flow are suggested by the findings. Additionally, the study discovered very no association between MVA and EPS or EPS, coming to the conclusion that share prices based on earnings or dividends are not credible.

Kaur and Narang (2006) compare the financial performance of Infosys Technologies Limited (ITL) by using both value-based and conventional metrics. It was discovered that the conventional financial performance metrics appeared to have fallen short of accurately representing the company's actual financial performance. Furthermore, a positive correlation between ROCE and EVA has been found. For forecasting and decision-making, a cause-and-effect link may thus be established using this relationship. The chi-square test results also show that there is no discernible difference between the value the company creates and what shareholders expect it to create. Therefore, ITL has succeeded in creating value for shareholders.

Awan, Siddique, and Sarwar (2014) determine the impact of economic value added (EVA) on stock return for companies included in the KSE-100 index. The panel data approach is used in the research model. There are 59 firms in the sample. The findings show that economic value added (EVA) has an impact on the stock's value and that this impact is considerable at a level below 10%.

Ahmed (2015) focuses on determining the relationship between the selected Islamic banks in Bangladesh over five years from 2009 to 2013, including the firms' earnings, economic value added, and shareholders' value. While the simple regression approach was used to determine the impact of business earnings and economic value added on changes in the stock price, the correlation method was employed to determine the relationship. The results show that the market price per share, economic value added per share, and earnings per share of the companies are strongly correlated. Additionally, research reveals that the economic value

added—rather than the banks' conventional measurements of earnings—can explain the share price of Islamic banks in Bangladesh more fully.

Gandhi, Mehta and Chhajer (2020) apply the CAMEL model to assess the ICICI Bank mergers. Three years of pre-merger and three years of post-merger data were considered for the study. It was discovered that following these mergers, ICICI Bank's financial performance had not much improved.

Gupta (2014) used the CAMEL approach to assess public sector banks' performance in India during five years, from 2009 to 2013. Andhra Bank topped the list based on the CAMEL model study, followed by Bank of Baroda, State Bank of Hyderabad, and United Bank of India, which came in last.

Kumar, Harsha, Anand and Dhruva (2012) examine the performance of twelve public and private sector banks in over eleven years (2000-2011). The CAMEL technique has been employed for this purpose, and the results demonstrate that private sector banks rank first on the list and have the best soundness performances. In comparison, public sector banks such as Union Bank of India and SBI have been observed to have retreated and to have low levels of economic soundness.

Lakhtaria (2013) examines the performance of three public sector banks in the Indian banking industry—Bank of Baroda (BOB), State Bank of India (SBI), and Punjab National Bank (PNB)—during three years (2010–2012). This paper uses the CAMEL approach to rank the banks under consideration based on performance using different ratios that are part of the study approach.

Misra and Aspal (2012) make an effort to assess the State Bank Group's performance and financial stability using the CAMEL method. It was discovered that State Bank of Bikaner and Jaipur (SBBJ) and State Bank of Patiala (SBP) ranked highest and lowest, respectively, in terms of the Capital Adequacy criteria. SBBJ was ranked highest in the Asset Quality criteria, whereas SBI was ranked lowest. Within the Management Efficiency Parameter, State Bank of Travencore (SBT) secured the top spot, whereas SBBJ secured the lowest rank. State Bank of Mysore (SBM) was ranked highest in terms of Earning Quality criterion, whereas SBP was ranked lowest. SBI ranked highest and SBM ranked lowest in terms of the liquidity criteria. SBBJ should increase the effectiveness of its management, SBP should increase the quality of its earnings, and SBI has to strengthen its position in terms of capital adequacy and asset quality.

Mathur and Sharma (2021) apply the CAMEL method to examine the financial performance of SBI and its affiliated banks both before and after the merger. The merger had no appreciable impact on SBI's financial situation. Strong evidence suggesting the merger lowers SBI's overall profitability was discovered during the investigation.

Kabir and Dey (2012) use the CAMEL Rating to compare the performance of two of the top commercial banks in the private sector: IFIC and EXIM bank. The study's conclusions indicate that while IFIC Bank outperforms EXIM Bank in terms of capital adequacy and leverage ratios, it performs worse than the latter in terms of return on equity and net worth protection. In terms of "asset quality," IFIC Bank performs significantly better than EXIM Bank when it comes to the percentage of classified loans, whereas EXIM Bank has higher income per share when it comes to "management capacity." Additionally, EXIM bank spends less per employee than IFIC bank. In terms of earning ability, IFIC Bank's net investment margin performs admirably, but EXIM Bank has been outperforming it in terms of other metrics like net profit margin, diversification ratio, and earnings per share. In conclusion, IFIC Bank has demonstrated exceptional performance in terms of loan to deposit ratios and earning assets to deposit ratios, however its liquid asset to total deposit ratio has underperformed compared to EXIM Bank.

Gupta and Verma (2008) use the Composite Ranking Method to conduct a comparative study of the largest private sector banks. Ten significant private sector banks have been taken into consideration in this study. According to the data, Karur Vysya Bank leads the field in terms of overall performance, followed by City Union Bank and Kotak Mahindra Bank, in that order. Despite being ranked third, Kotak Mahindra Bank's worst category is the management of non-performing assets. YES Bank has performed remarkably well for a fledgling bank, placing it in fourth place. Karnataka Bank and ICICI are positioned very close to the centre of the Composite Rank. Although the Bank of Rajasthan has been in business for a considerable amount of time, its overall performance is far from ideal. Out of all the Banks that are being studied, it has the lowest Composite Rank.

Reddy (2012) uses the CAMEL technique to assess the relative performance of Indian banks. It is discovered that public sector banks have much improved, demonstrating the beneficial effects of the reforms in raising competition, rationalizing directed credit and investments, and liberalizing interest rates.

Prodanov, Yaprakov and Zarkova (2022) seek to determine the consequences of Bulgaria's commercial banks' reorganization and consolidation. The results show that, ever since Bulgaria joined the EU, European methods have been successfully integrated to promote competitiveness across banks in the nation. This places Bulgaria among the top East European nations in terms of the advancement of bank products and the effectiveness of its financial system.

Aghakarimi, Fereidouni, Hamid, Rabbani and Rabbani (2023) use the CAMELS indicators (capital adequacy, asset quality, management, earnings, liquidity, and sensitivity to market risk) to assess the financial soundness of 11 Iranian private banks. The Best-Worst Method (BWM) is used to determine the weights of the indicators. As a result, the Decision-Making Units' (DMUs') efficiency score is determined using Data Envelopment Analysis (DEA). To validate the DEA results, Principal Component Analysis (PCA) is utilized. The findings show that Iranian private banks perform the worst when it comes to asset quality and the best when it comes to management and capital adequacy measures.

VS (2022) assess SBI's eight-year performance using the CAMEL model, taking into account the impact of the bank's merger with five of its subsidiaries and Bharatiya Mahila Bank on SBI's overall performance. Based on this analysis, we can conclude that the 2017 SBI merger improved the bank's capital adequacy and liquidity while also improving asset quality. Simultaneously, SBI experienced difficulties in terms of management efficiency and earnings quality during the initial years following the merger.

Lad and Ghorpade (2022) make an effort to use the CAMEL Rating System to assess the performance of a few Indian public sector banks. The study's sample of eighteen public sector banks spans a five-year period, from 2015 to 2019. According to the research, IDFC First Bank Ltd. is placed last among all the selected institutions, while Bank of Maharashtra has performed the best overall and is ranked first.

Reddy, Murugananthi, Palanichamy and Vasanthi (2022) evaluate public sector banks' financial results both before and after the Government of India's announced megamerger, which combined 10 public sector banks into 4. To assess the merger's efficacy, the influence on the bank's performance was quantified and contrasted. The analysis's findings led to the conclusion that, following the merger, the financial performance of an Indian bank differed significantly from that of the other banks, although there was no discernible difference in any bank's performance.

Crowley, Sikder and Dhar (2022) use its CAMEL-based performance record to analyse the financial, operational, and strategic performance of Commercial Bank of Ceylon Bangladesh Operations (CBC). According to the CAMEL rating research, the bank is doing exceptionally well in three of the five categories, including asset management, ROA of earning potential, and capital sufficiency. In terms of managerial effectiveness and earning capacity ROE, CBC has performed satisfactorily and fairly, respectively. The bank appears to be deficient solely in the area of liquidity management.

Alfadli and Djalila (2022) use a sample of 62 commercial banks that were listed on stock markets and operated in GCC nations between 2011 and 2018 to determine the factors that affect bank capital adequacy ratios. The empirical findings revealed that the following CAMELS model factors had a positive statistically significant impact on bank capital adequacy ratios: capital ratio, earning capacity, liquidity management, and sensitivity. On the other hand, the capital adequacy ratios of commercial banks are adversely affected by asset quality, market concentration, and bank size. In terms of macroeconomic factors, the empirical findings indicated that inflation and economic growth have an impact on bank capital adequacy ratios.

Mashhadi, Ghaffari, Hosseini and Peykarjou (2022) calculate the CAMEL composite index and examine the 2010–2017 association between 16 Iranian banks' banking soundness and income diversity. This study computed the CAMEL composite, which was previously determined by arithmetic mean, using an exploratory factor analysis (EFA). In addition, income diversification has been computed using the Herfindahl-Hirschman index (HHI). The association between the variables has been examined using the generalized method of moments (GMM) panel model. The GMM panel model's outcome demonstrates a strong and positive correlation between financial performance on income diversification and financial competence.

Obianuju, Anayochukwu, Promise and CJ (2022) classified each bank's performance in the post-consolidation period using the CAMEL Composite Rating Ratios. The study's conclusions showed that Nigerian banks had sufficient capital in the years after their consolidation. Additionally, it was found that throughout that same time frame, these banks maintained good earnings, but during the post-consolidation era, liquidity was lacking. Furthermore, the analysis showed that although management's operational efficiency is just mediocre, asset quality was extremely low. Therefore, the report suggests that the central

bank immediately implement strict monitoring procedures to guarantee that credits are only extended to viable firms to stop the trend of rising non-performing loans in the banking industry.

Thisaranga and Ariyasena (2021) examined the impact of CAMEL criteria on the accounting-based and market-based performance of eight listed commercial banks in Sri Lanka for the years 2014–2019. One accounting-based performance metric is the return on equity (ROE), whereas one market-based metric is Tobin's Q ratio. The results show that whereas other CAMEL variables have a negligible effect on market-based performance, capital adequacy, asset quality, and liquidity status have a positive substantial impact on market-based performance. Additionally, earning potential has a significant positive correlation with accounting-based performance and a negative correlation with management efficiency. The accounting-based performance of commercial banks in Sri Lanka is largely unaffected by other CAMEL indicators.

Dhawan (2021) uses the CAMEL model of performance evaluation to assess the banking industry's financial performance in Saudi Arabia. A multiple linear regression model has been used for the investigation, which covers the nine-year period from 2009 to 2018. According to the study, there are conflicting effects of CAMEL-specific criteria on the chosen bank's financial performance. Bank performance is positively impacted by both asset quality and capital sufficiency. Additionally, the study shows that the profitability of the bank is barely impacted by management effectiveness. Furthermore, achieving quality also denotes a detrimental impact on profitability. Asset quality and ROA have a negative association. It is hypothesized that those banks with larger operating profitability and better liquidity management could declare high profits.

Pandit and Gandhi (2021) make an effort to use the CAMEL model to compare State Bank of India and HDFC Bank. The findings show that while State Bank of India outperformed HDFC Bank on the liquidity criterion, HDFC Bank outperformed State Bank of India on the capital adequacy, asset quality, and management parameters. With regard to the quality of their earnings, both banks have done equally well.

Hymavathi (2021) makes an effort to use the CAMEL approach method to examine the financial performance of a few public sector banks (SBI, Bank of Baroda & Union Bank) and private sector banks (HDFC, ICICI & Axis Bank). According to the study's findings, ICICI Bank has the best capital adequacy and management efficiency ratios. In terms of asset

quality and earnings ratio, HDFC Bank leads, while Bank of Baroda leads in terms of liquidity ratio. Out of all the institutions selected for examination, the private sector banks' financial performance, specifically that of HDFC Bank and ICICI Bank, is superior for the years 2015 to 2019.

Mathur (2021) makes an effort to assess SBI Bank's pre- and post-merger performance using the CAMEL Model between 2014–15 and 2018–19. The study's findings indicate that SBI's post-merger management effectiveness, earnings quality, and liquidity have all improved. The bank must prioritize raising its asset quality and capital adequacy ratio, nevertheless.

Pandey and Joshi (2021) evaluate the public and private sector banks' respective performances. The banks are chosen according to the amount of money they make. The data was obtained from the 2015–2019 annual reports of a few chosen institutions. Their relative financial strength is compared using the thirteen parameters of the CAMEL model. The findings show that public-sector banks outperformed private-sector banks in terms of performance.

Banu and Vepa (2021) employ the CAMELS Model to analyse the financial performance of two public sector banks and the two largest private sector banks. SBI, HDFC, ICICI, and Syndicate Bank were the banks that were the subject of the investigation. Private sector banks perform better overall than public-sector banks.

Gaikwad and Shinde (2020) ascertain how merger activity affects the State Bank of India's operational effectiveness. The CAMEL model is used to analyse SBI's operational efficiency. For analysis, the three years before and three years following the merger are taken into account. According to the analysis, SBI's capital adequacy and liquidity are unchanged from the pre-merger period to the post-merger period. However, when comparing the post-merger period to the pre-merger period, there is no discernible improvement in the asset quality, management efficiency, or earning quality parameters. Overall, it is determined that there has been no improvement in State Bank of India's operational efficiency between the pre-and post-merger periods.

Mohapatra and Behera (2022) examine the performance of small-cap listed private banks from 2010 to 2020 using the CAMEL technique. There are eight banks chosen to represent the sample size. The study's ranking of banks is presented at the end. For example, City Union Bank received rank 1, followed by Karur Vysya Bank. Dhanlaxmi Bank, which is ranked eighth, is the weakest bank, followed by South Indian Bank.

Singh and Agarwal (2017) evaluate the efficacy of the merger through a comparison of the independent and combined regional rural banks' post-reorganization financial results. The CAMELS Model is used to gauge these banks' level of financial stability. The analysis shows that improving the financial performance of the RRBs requires more than just combining banks. Bank consolidation with a strong plan is necessary for their stable and sustainable financial performance.

Yadav and Jang (2021) contrast the impact of the merger on its financial performance before and after, as determined by CAMEL Analysis. Secondary data covering ten years—five years before the merger (2003–2008) and five years following the merger (2009–2014)—was employed in the analysis. A paired sample T-test was also used to assess the impact of the merger on financial performance and determine whether there was a statistically significant difference in the CAMEL ratios before and after the merger. The outcome demonstrated that HDFC's financial performance improved following the merger and that the merger had a beneficial effect.

Suresh, Varalakshmi and Murthy (2022) used the CAMEL model to assess the productivity and financial performance of the banks chosen in the Sultanate of Oman from 2011 to 2016. The study's conclusions will aid interested parties in comprehending the productivity and performance of the chosen banks in light of potential future investments and expansion. After applying the CAMEL criterion to evaluate the total performance of the chosen banks, it was discovered that Ahli Bank had the highest productivity and profitability, while Oman Arab Bank had the lowest place.

Garg (2022) makes an effort to assess the financial stability and performance of a few chosen private sector banks, including ICICI, HDFC, and YES Bank, using the one-way ANOVA method and the CAMEL approach from 2017 to 2021. It has been noted that ICICI Bank consistently held the top spot. Additionally, it was noted that Yes Bank ranked lowest in a few chosen CAMEL ratios.

Raj (2022) evaluates the 2018 performance and financial stability of a few chosen Indian private and public banks. CAMEL methods have been employed to examine the selected banks' financial stability. Here, a comparative and important investigation of the numerous CAMEL characteristics has led to a conclusion through the use of Composite Rankings and Averages. According to the CAMEL research, HDFC Bank comes in first, followed by Axis

Bank. Third on the list was ICICI. Among all the chosen banks, SBI holds the fourth spot, Bank of Baroda the fifth, and Bank of India the last position.

Kulshrestha and Srivastava (2022) use the CAMEL rating approach to examine and contrast the financial performance of the public and private banking sectors. A total of fourteen banks, representing both public and private sectors, have been chosen for this purpose. The findings indicate that private sector banks outperform public sector banks in terms of performance. Overall, the findings show that the adoption of contemporary technology-driven banking reforms and recovery mechanisms has enhanced the performance of private sector banks.

Abebe (2022) investigated how Ethiopian banks' performance was affected by CAMEL components. The dependent variables were ROA and ROE, while the independent variables were capital adequacy, asset quality, management efficiency, earnings ability, and liquidity. The study discovered that the performance as determined by ROA and ROE is statistically significantly impacted by capital adequacy, asset quality, and managerial efficiency. Liquidity and earning potential have no discernible impact on ROA and ROE performance metrics. Therefore, to enhance their performance, banks should focus on capital sufficiency, asset quality, and managerial efficiency.

Amer (2021) uses the components of the CAMELS model to assess and determine the key factors influencing the performance of Jordanian commercial banks. The study focused on how twenty commercial banks in Jordan that were listed between 2014 and 2019 performed to their listing on the Amman Stock Exchange. The two criteria that were used to gauge the banks' performance were the rates of return on equity and assets. However, in addition to macroeconomic variables like the rate of inflation and economic growth, the independent variables also contained the CAMELS model elements—capital adequacy, asset quality, management efficiency, earnings, liquidity, and sensitivity to market risks.

Hussein and Al-Dulaimi (2022) examine the impact of CAMELS criteria on the return on equity in Iraqi commercial banks is examined in. These factors include capital adequacy, asset quality, management, earnings, liquidity, and sensitivity. The study collected secondary data from 2011 to 2020 by utilizing twenty databases from commercial banks. We also looked into the relationship between the variables using the Moments-Quantile-Regression (MMQR) technique. In commercial banks in Iraq, capital sufficiency, asset quality, management, profits, liquidity, and sensitivity all positively connect with return on equity.

Jawarneh (2022) investigates the connection between the elements of the CAMELS model and the profitability of banks as indicated by Return on Equity (ROE) and Return on Assets (ROA). The results indicate that the financial performance of Jordanian commercial banks, as determined by the ratios of ROA and ROE, is positively but not statistically significantly impacted by the Capital Adequacy Ratio, Earning Ability, and Liquidity. The findings also show that Jordanian commercial banks' financial performance, as measured by the ROA and ROE ratios, is negatively and non-statistically significantly impacted by asset quality, management effectiveness, and sensitivity to market risks.

Magoma, Mbwambo, Sallwa and Mwasha (2022) examine the financial results of seven commercial banks that are listed on the Dar es Salaam Stock Exchange (DSE) throughout five years, from 2016 to 2020. To thoroughly evaluate the financial stability of these listed banks, the CAMEL model was applied. The results show that capital sufficiency and managerial effectiveness have the biggest effects on Tanzanian commercial banks listed on the DSE.

Mazengo and Mwaifyusi (2021) examine the impact of company size, profitability, and liquidity on the dividend distribution of financial enterprises registered on the Dar es Salaam Stock Exchange (DSE). An explanatory research design was adopted in the study. All financial firms that were DSE-listed between 2015 and 2019 were included. Regression analysis, correlation, and descriptive statistics were used to analyse the data. The findings indicate that three independent variables—profitability, liquidity, and firm size—have a positive and significant link with the dividend distribution of financial companies. The study concludes that the primary factors influencing dividend distribution for financial enterprises listed on the DSE are profitability, liquidity, and company size.

Qureshi and Siddiqui (2023) examine the potential positive or negative effects on bank performance of the CAMEL model's capital adequacy, asset quality, management efficiency, earnings ability, and liquidity management components. To perform the study, we looked at ten of Pakistan's largest banks and gathered information between 2015 and 2020. The results showed that the CAMEL model significantly affects bank performance overall. The CAMEL model's application to this study suggests that banks should closely monitor their non-performing loan portfolios, work to improve the quality of their assets, and concentrate on raising their profit margins.

1.20. Research gap

The mega-merger is the most recent and largest merger in the history of the Indian banking sector. The government of India considers the mega-merger initiative as an important step towards achieving a $5 trillion economy. The research that has been done on the mega-merger event is empirical and descriptive, giving an overview of the mega-merger event in general. This event has not been analysed using proper valuation tools in previous studies. Therefore, by studying the mega-merger event using various tools of performance evaluation, the study contributes to the existing research.

1.21. Conclusion, Findings and Recommendations

This section deals with the summary of the chapters of the research, major findings, and observations and recommendations of the researcher.

1.21.1. Summary of the chapters

The first chapter deals with the introduction of the study. It provides a foundational discussion about banking and its functions. It also elaborates on the concept of merger and acquisition as a strategic tool, its types, advantages, disadvantages and rationale behind bank mergers. This chapter also includes the objectives, scope, and the chapter plan of the research.

Literatures form the base for any research. Hence, the second chapter comprises of the literatures that have been reviewed for this study. This section includes literatures that has covered various aspects, such as, evolution of banking system, history of mergers and acquisitions, mergers in the banking sector with major focus on the Indian banking system, effect of merger activities on different banks, methods to evaluate the financial and market performance of the banks, and effect of various factors on the performance of the banks. lastly, this chapter provides the research gap in the existing literature that has helped in the formation of the objectives of this study.

The fourth chapter deals with the research design which includes the research questions that will be enquired in the study, research objectives, rationale and scope of the study, different hypotheses formulated, and various tools and techniques used for the study. The research implements Brown and Raymond Model (1986) to predict the outcome of the merger, as well as to find out if there has been a synergistic benefit of merger. Economic Value Addition and

Market Value Addition has been calculated to find out the effect of merger on the value addition of the banks under study, and CAMEL framework model has been used to evaluate the financial health of the banks. Lastly, a panel regression model is used to find out the effect of the CAMEL components on the EVA and MVA of the banks under study.

The objective of the fifth chapter is to predict the outcome of merger and to find out if there has been a synergistic benefit value synergy resulting from merger of Public Sector banks. Brown and Raymond Model (1986) is used for the purpose of prediction of the success of merger as well as valuation of synergy. It was designed by Keith C. Brown and Michael V. Raymond for predicting the success of M&As and it can be used to demonstrate the market's ability to discriminate between various types of acquisition proposals and predict the probability of success of the deal.

The objective of the sixth chapter is to find out if the merger has led to a change in EVA and MVA of the banks that have been merged as a part of the mega-merger initiative of the government of India. The study enquires from the period of 2017-2023 with the window period of 2020 as the mergers took place during this period with three years pre and three years post event study.

The objective of the seventh chapter is to find out if the CAMEL components of the banks in the study have improved post-merger. CAMEL stands for Capital Adequacy, Asset Quality, Management Efficiency, Earnings Quality and Liquidity. This framework was developed in the United States in 1980s to categorize the overall condition of the bank based on five broad prospects. This framework helped the supervisory authorities to establish a uniform assessment system that would evaluate the condition of the banks under various supervisory criteria.

The objective of the eighth chapter is to analyse the effect of CAMEL components on the EVA and MVA of the anchor banks. Anchor banks are the banks that have retained their identity after the merger process that was initiated by the government of India as a part of the mega-merger initiative that was announced on 30th August 2019 and came into effect on 1st April 2020. In this study, the anchor banks are Punjab National Bank, Canara Bank, Union Bank of India, and Indian Bank. The study has implemented Panel Regression to find the effect of the CAMEL components on the EVA and MVA of the banks under study. Panel data analysis is a combination of cross-sectional and time series analysis. It is a method of analyzing data that have been collected from different cross-sectional units for a number of

time points. It provides in-depth knowledge as it enables us to observe data from various cross-sectional units over different period of time.

1.21.2. Major Findings

a) The mega-merger event has not been analysed using proper valuation tools in the previous studies.

b) The government's motive behind initiating mergers between banks is primarily to address the issue of rising non-performing assets (NPAs) in the Public Sector Banks, safeguard customers of weaker banks from incurring financial losses, establish larger banks capable of competing globally, and contribute to overall economic growth of the country.

c) The Brown and Raymond Model (1986) rightly predicts the outcome of the mergers. There has been no synergy in the merger of the banks under study as evaluated by the Brown and Raymond Model (1986) and therefore, the null hypotheses(H_0) that states that there has been no synergy in the merger of the given banks cannot be rejected.

d) It was observed that the Economic Value Addition of the banks have significantly improved in the post-merger period whereas MVA has shown an insignificant change. Therefore, the null hypothesis (H_{01}) which stated that the EVA of the merged entities have not improved post-merger is rejected. However, the other null hypothesis (H_{02}) which stated that the MVA of the merged entities have not improved post-merger cannot be rejected.

e) It was observed that even though there has been significant improvement in some ratios, the overall performance of the banks as reflected by the Composite Weighted Score of the Model (CWSM) does not seem to have significantly improved post-merger. Therefore, the null hypothesis stating that the CAMEL components of the banks have not improved post-merger cannot be rejected.

f) The panel data analysis shows that all the independent variables that are negatively affecting the dependent variable are statistically insignificant. It has also been observed that all the independent variables that have a statistically significant relationship with the dependent variable are positive in nature. Therefore, we reject both the null hypotheses (H_{01} and H_{02}) for the ratios that have significant effect on the dependent variables (EVA and MVA) which states that the CAMEL components have not affected the EVA and MVA of the banks and accept that the CAMEL components have affected the EVA and MVA of the banks, and the effect is positive.

1.21.3. Observations and Recommendations

a) The merger in the banking sector should be between banks of equal size. Absorbing a weak or a loss incurring bank may negatively impact the financial performance of the absorbing bank.

b) The mergers had taken place during the period of stock market crash due to the onset of covid-19 in the country. Therefore, it is very likely that the outcome of the merger has been affected by the pandemic.

c) Government initiated mergers are mostly guided by motives like reduction in NPAs, to safeguard customers of weaker banks from incurring financial losses, establish larger banks capable of competing globally, and to contribute to overall growth of the country.

d) Synergy arising out of merger may not always be reflected on the stock price.

e) Synergy may not reflect immediately after merger, and may take some time to reflect on the performance of entity.

f) EVA shows a significant positive change whereas, MVA shows insignificant change. This could be due to the fact that MVA is more vulnerable to market volatility than EVA.

g) All banks have seen a decline in non-performing assets, signifying improving asset quality.

h) All banks have shown a decline in the total advances to total assets ratio, whereas the majority of banks have seen a rise in the total investment to total assets ratio. This means that there is a decrease in the bank's lending aggressiveness, and increase in the use of assets for investments against advances.

i) The government securities to total investment ratios have increased for most banks indicating lower level of risk involved in their investments.

j) For every bank, the ratio of total advances to total deposits has dropped revealing inefficiencies in the management's ability to turn available bank deposits into high yield advances.

k) Return on Net Worth, Business per Employee, Net Interest Margin, and Return on Asset have increased for all banks, which indicate increased profitability, effective human resource management, and higher earnings.

l) CAMEL framework is an effective and widely used method to evaluate the financial performance of banks. Banks are the major backbone of any economy and their performance have a direct impact on a country's overall growth. Hence, the banks under the study should adopt effective measures to improve their CAMEL score.

m) Since CAMEL components have a positive effect on EVA and MVA, banks should focus on improving their CAMEL scores to improve their overall performance.

1.21.4. Limitation of the study

The period of study had been a limiting factor for this study

1.21.5. Scope for future research

a) This study is limited to a particular merger event. Similar studies can be conducted to analyze bank mergers in both public and private sector.

b) The mega-merger event can be studied further for a longer time frame.

c) The research confirms the robustness of the Brown and Raymond Model. Therefore, it can be used to predict the outcome of upcoming merger events as well.

d) Other ratios defining the CAMEL components can be included for a more in-depth study.

e) The CAMEL model can also be used to rank the banks by making a comparative performance analysis between the banks.

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