“EVALUATING FINANCIAL PERFORMANCE OF SELECTED PUBLIC SECTOR BANKS IN INDIA : A STUDY BASED ON THE CAMEL MODEL”

A THESIS

SUBMITTED BY

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DECLARATION BY THE CANDIDATE

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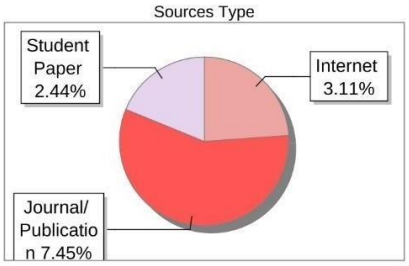

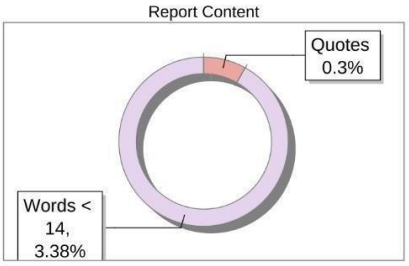

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PREFACE

The banking industry is essential to a nation's financial stability and economic expansion. Financial inclusion and national development initiatives have been greatly aided by public sector banks in particular. To comprehend their effectiveness, stability, and profitability, stakeholders, investors, and policymakers must evaluate their financial performance.

According to the study "Evaluating Financial Performance of Public Sector Banks in India: A Study Based on CAMEL Model," banks' financial health is examined using the CAMEL framework. Capital Adequacy, Asset Quality, Management Efficiency, Earnings, and Liquidity are the five main parameters that make up the CAMEL model, which offers a thorough way to assess banks' overall performance. By looking at these factors, the study aims to pinpoint the public sector banks' areas of strength, weakness, and improvement.

Recent decades have seen substantial changes in the Indian banking industry as a result of technical breakthroughs, regulatory changes, and economic liberalisation. The necessity for effective capital management, the rise of non-performing assets (NPAs), and the competition from private and foreign banks are just a few of the difficulties public sector banks have had to deal with. In this regard, it becomes essential to systematically assess their financial performance using a recognised framework in order to comprehend their sustainability and resilience.

Financial data from selected public sector banks has been examined during a given time frame in order to carry out this investigation. Their performance was evaluated using a range of financial ratios and indicators related to the CAMEL model. Furthermore, statistical methods, such as a single-factor ANOVA test, have been used to ascertain whether there are notable differences in the financial parameters of various banks. The results are intended to offer a data-driven viewpoint on PSBs' financial well-being in India.

I hope this study would be a helpful resource for academics, banking experts, and legislators who want to comprehend the financial performance of India's public sector banks. In the end, I think the study's conclusions will assist create a stronger and more resilient financial system by adding to the current conversations on banking sector reforms and financial stability.

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INTRODUCTION TO THE BANKING SECTOR AND PERFORMANCE EVALUATION IN INDIA

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1.1 Indian Banking Industry : An Overview

The Indian banking system has developed over time and plays a vital role in maintaining economic expansion by meeting the various financial requirements of people, companies, and sectors. Serving as a go-between for depositors and borrowers, it encourages effective resource allocation and boosts economic expansion in general. Over 9,500 non-banking financial firms (NBFCs) and 137 commercial banks, cooperative banks, and local banks currently offer banking services in India. There are currently financial services within a 5-kilometer radius, and 99.97% of the population's residential regions are covered by improved access projects.

The banks that are included in the Reserve Bank of India Act, 1934's Second Schedule are known as scheduled commercial banks. Additionally, the Reserve Bank of India permits cooperative banks to offer banking services in accordance with the Banking Supervision Act, 1949.

1.2 Origin of Bank :-

There is no widely recognised hypothesis regarding the origin of the name "bank" because banking started at different times in different countries. The English term "bank" is supposed to have sprung from the French word "Banque," which meaning "bank." The first people to establish banking in Lombardy were Jews. They were referred to as "bankers" when they or their business filed for bankruptcy. According to a different idea, the word "bank" can have originated from the German word "bank," which refers to a stock fund. After that, it was renamed "Bank" in English, "Banco," and finally "Banco" in Italian (Gordon and Gupta, 2012). This notion appears viable and widespread even now.

In the first ten years of the eighteenth century, banking made its debut in India. When British merchants arrived in India in the 17th century, they were unable to employ native banks and bankers because of language hurdles and other issues.

In 1786, the General Bank of India was founded as an Indian bank. Traditional banking from the British era to the reform era, bank nationalisation and privatisation, and the rise of foreign banks now doing business in India are all part of the lengthy history of the Indian banking sector. Banking in India has a lengthy

history. The Indian banking sector has grown to unprecedented heights in tandem with the times. Technology has had a significant impact on how banks function (Suba, 2012).

1.3 Meaning of Bank :-

Similar to how a tree may be understood by its fruits, a bank's operations can be used to gauge its significance. The history, evolution, and advancement of banking are similar to those of everything else. Banks are financial organisations that support the nation's balanced growth by offering medium- and long-term financial assistance. The market's biggest source of money is banks, which also facilitate payment systems and take deposits. Financial stability and sustainable development depend on a safe and sound banking system.

1.3.1 Definition of Bank :-

The statutes that govern all Indian banking organisations are the Reserve Bank of India (RBI) Act of 1934 and the Banking Regulation Act of 1949. The Act outlines the proper treatment of banks, their rights and obligations, and other particulars. "Taking deposits from the public for the purpose of lending or investment, repayable on demand and withdrawable by cheque, draft, order or otherwise" is the definition of banking given in Section 5(1)(b) of the Banking Regulation Act, 1949.

1.4 Functions of Bank :-

The banking industry plays a major role in contemporary economies. It is essential to an economy's success and one of the main pillars of the financial system. Among the financial system's first financial intermediaries are banks.

They are necessary for drawing deposits and distributing credit to different areas of a country's economy. Any nation's economy primarily rests on the stability and efficacy of its financial system, which is reliant on a robust banking industry.

A banking company is defined as "a company carrying on the business of banking in India" in Section 5(1)(c) of the Banking Regulation Act, 1949. The functions of commercial banks in India are outlined in the Banking Supervision Act of 1949. As

a result, a commercial bank's operations can be separated into two groups: primary and secondary.

1. **Primary Function :-** Banking functions are another name for a bank's primary operations. These are a bank's primary duties.

   The main functions of a bank are :

- **Deposits :-** Advances are made out of the mobilised deposit amount. The amount of money available for lending increases as more deposits are mobilised. Savings are the key to deposit growth. These savings must be mobilised and directed towards capital production in order to spur economic growth.

1) Saving Deposits :-

Encourage people to start saving money. This benefit is available to the working class. Interest rates are quite low. The quantity and frequency of withdrawals are unlimited. One or two names can be used to open a savings bank account. Only a minimum balance must be maintained by depositors; the precise amount is determined by the bank. The bank additionally offers check books, online banking, and ATMs that double as debit cards. You can learn more about the various test kinds by visiting the websites that are linked.

2) Fixed Deposits :-

An alternative term for a time deposit. There is a deadline for making deposits. During this time, you will not be able to withdraw money. The bank will levy a fine on depositors who take their money out before the maturity date. Although it fluctuates based on the deposit length, the interest rate is higher because the entire amount is paid all at once over time.

3) Current Deposits :-

Entrepreneurs are starting companies. The account customer can benefit from overdraft protection with this account. In an emergency, these deposits may be utilised as short-term loans. In addition to overdraft fees, banks impose hefty interest rates to cover unforeseen overdraft requirements.

4) Recurring Deposits :-

A certain sum is deposited into the bank on a regular basis. Only after a predetermined period of time has elapsed can you take your money out. Compound interest is a feature of fixed deposits that enables depositors to build up substantial sums of money and subsequently earn higher interest rates. Both salaried people and small business owners can run this kind of account.

- **Providing Loans and Advances :-**

Interest rates on loans and advances are greater than those on deposits at banks. The difference between the interest rates they pay on deposits and loans is how banks generate their profits.

Bank offers following type of loans and advances :-

1) Bank Overdraft :-

Customers who already have an account can use this service. The cardholder may withdraw more money than the amount in his bank account at any moment, up to a predetermined amount. Collateral is needed to get an overdraft facility. Only the amount borrowed during the borrowing period is subject to overdraft interest.

2) Cash Credit :-

A short-term loan contract having a maximum amount that has been established. Customers can borrow money from the bank using collateral or real assets as security. Cash credit is available to all kinds of account holders, not simply those without bank accounts. Withdrawals that exceed the limit are subject to interest charges. Cash credit facilities offer larger loan amounts than overdrafts for a longer duration.

3) Loans :-

In return for actual assets, banks provide their clients short- or medium-term loans with terms ranging from one to five years. Long-term loans are offered by banks. The loan may be repaid in full or in instalments over a predetermined time period. The bank charges interest on the amount actually sanctioned, regardless of whether the loan is terminated. The interest rates on overdrafts and cash credit are higher than this rate.

4) Discounting the Bills of Exchange :-

The seller can lower the bank fees for these short-term loans by paying a little fee. To advance money, banks purchase or discount bills of exchange. This is the amount that the buyer (payee) paid to the seller (payee) for the bill, less the customary discounted fees. When the bill of exchange matures, the bank collects the remaining amount and presents the bill to the payor or payee.

2. **Secondary Function :-** Similar to a bank's basic functions, its subsidiary functions fall into one of two groups :

- Agent Services
- Practical Functions

- **Agent Functions of Bank :-** Since banks act as their clients' agents, they must carry out a number of agency duties, as listed below :

  1) Funds Transfer : The transfer of funds from one branch or location to another branch or location.

  2) Regular collection : Collecting regular payments such as dividends, salaries, pensions, etc. on behalf of clients.

  3) Recurring Payments: Make regular payments on behalf of your clients, such as rent or utility bills.

  4) Check Collection : Just like banks collect funds from bills of exchange, banks collect funds from checks through the clearing department of the customer.

  5) Portfolio Management : Banks manage the assets of their clients. In addition to debiting and crediting accounts, they also buy and sell stocks and bonds for their clients.

  6) Other representation functions : In this arrangement, the bank represents the client before other organizations. The bank provides services to clients as executors, trustees, administrators, advisors, etc.

- **Other Practical Functions :-**

- Issuing letters of credit, traveller's cheques etc.
- Providing safe deposit boxes or lockers for safe storage of valuables, important documents and securities.
- Providing convenience of foreign exchange transactions to customers
- Underwriting of stocks and bonds
- Foreign exchange transactions
- Social welfare programs
- Project reports
- Providing permanent guarantees etc. to customers

1.5 History of Banking in India :-

Indian banking's history and how it has grown to be a vital component of the country's economic growth. Significant adjustments have also been made to the banking system and administration over time to accommodate people's evolving financial needs. Although India has had banking services since ancient times, the country's current organised banking system was established in 1947, the year it earned independence. Prior to the arrival of the British, a variety of financial activities were conducted, albeit in an unsystematic manner. The foreign banking system started to deteriorate in the 17th century when the British arrived. Mayer's Alexander Company established the Bank of Hindustan, Europe's first bank, in 1770.

Growth of the Indian Banking Industry : Over the years, there have been substantial developments in the Indian banking industry. India had banks even before it became an independent nation. The following succinctly describes the trends in the banking sector :

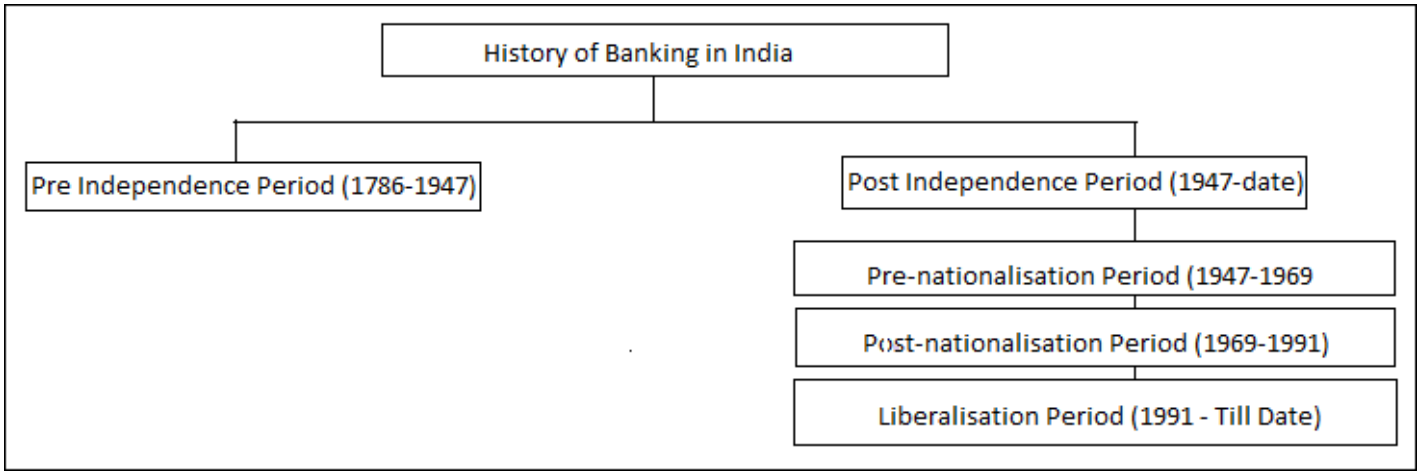

Figure 1.1 :- Indian Banking History (Source :- https://byjus.com/bank-exam/history-banking-india/)

- **Before Independence (1786-1947) :**

  The Bank of Hindustan, India's first bank, was founded in 1770 but failed in 1832. Only a small number of India's 600+ banks that were registered prior to independence still exist today. Among the well-known banks are the General Bank of India, the Commercial Bank of Oudh, and the Presidency Banks (Bank of Madras, Bank of Bombay, and Bangladesh Bank) founded by the East India Company. In 1921, the Imperial Bank of India was established by these three banks. Now the biggest public sector bank, it was nationalised in 1955 and rebranded as the State Bank of India.

- **Post-independence (1947–1991) :**

  At the time of independence, the majority of India's main banks were privately held, which pushed rural communities to rely on moneylenders for financial assistance. Under the Banking Supervision Act of 1949, the government nationalised banks, beginning with the Reserve Bank of India, in order to solve this issue. Apart from the 1955-founded State Bank of India, 14 additional banks were nationalised in 1969 and six more in 1980.

- **Effects of Nationalization :**

  Indian banks' nationalisation has a number of significant repercussions. The nation's general economic status improves, and more money is available for economic expansion. This action has increased the efficiency of the banking

sector and encouraged the growth of the rural and agricultural sectors. Huge career prospects are also created by this. The public benefits from these institutions' profits. Furthermore, because there is less competition, the industry runs more smoothly. This time frame was crucial to the expansion and advancement of India's banking sector following independence.

- **Liberalization Period (1991 to Present) :**

  The Indian banking industry experienced significant reforms under Mr. Narasimhan's direction, with the goal of guaranteeing the stability and financial prosperity of state-run institutions. One of the biggest shifts was the rise of private banks; ICICI, HDFC, and Axis were among the ten private banks licensed by the Reserve Bank of India. A number of new regulations were also implemented, such as granting Indian banks the ability to form partnerships with foreign banks, treating private and state-run banks equally, and permitting foreign banks to build branches in India. The industry was further modernised by the rise of small financing and payments banks as well as the growth of online banking. These measures are intended to guarantee the banking industry's long-term prosperity and help it adjust to evolving demands.

1.6 The Structure of Indian Banks :-

The Indian banking system is divided into two main sectors: the organised sector and the unorganised sector. The organised sector includes the Reserve Bank of India (RBI), commercial and cooperative banks, as well as specialised financial institutions such as ICICI and IFC. But because neither the government nor the Reserve Bank of India control the informal sector, it is susceptible to fraud and volatility.

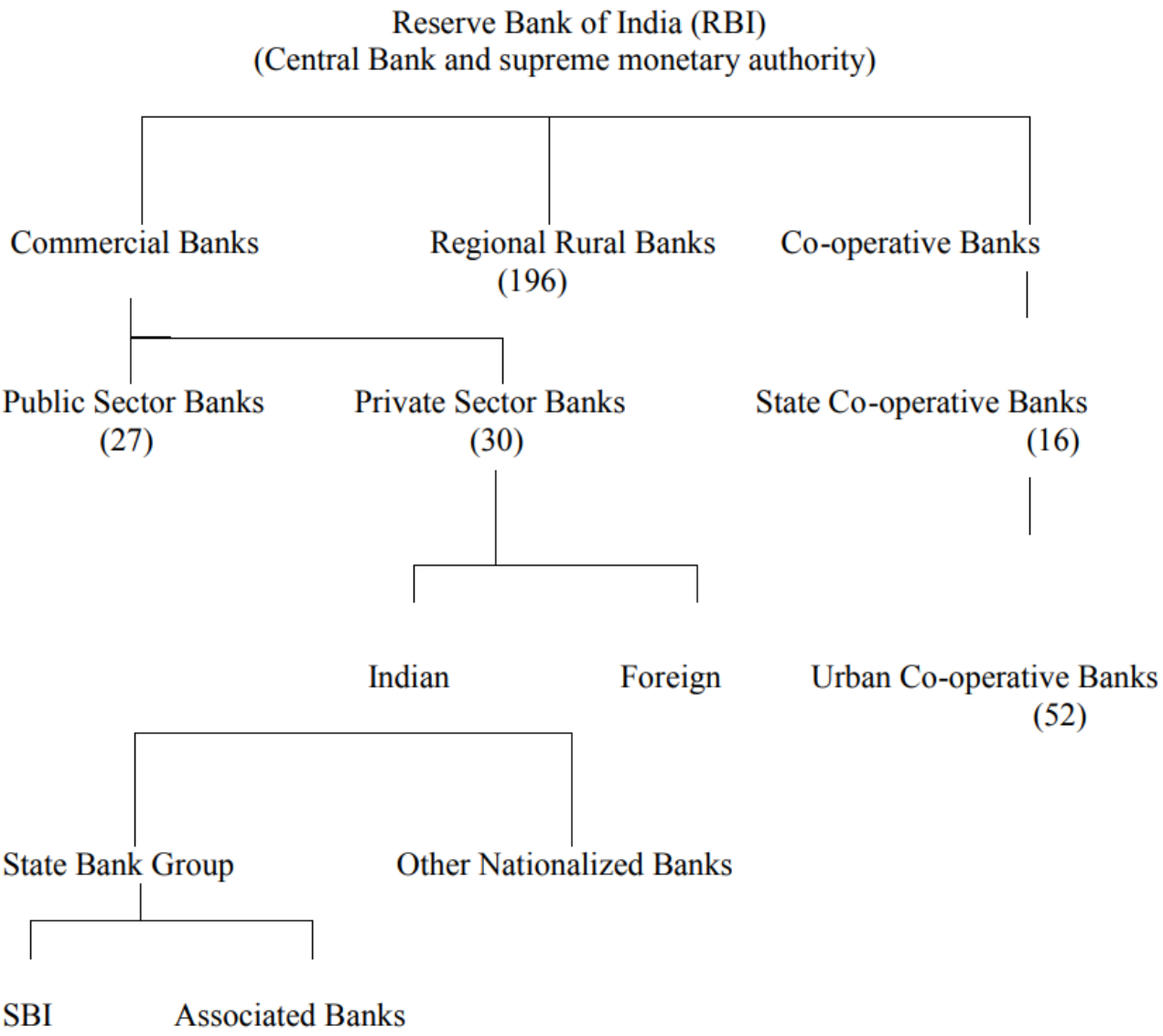

Figure 1.2 :- Banking Structure in India (Source :- Reserve Bank of India 2009; Banking Structure in India : RBI)

- **Scheduled Banks :-**

  Scheduled banks are those banks that are included in the Second Schedule of the Reserve Bank of India Act, 1934.

  • The paid up and raised capital should not be less than INR 500,000.

  • No activity of the bank should prejudice or adversely affect the interest of its customers.

  There are four types of scheduled commercial banks:

• Public Sector Banks

• Private Sector Banks

• Foreign Banks

• Regional Rural Banks

- **Non - Scheduled Banks :-**

According to Section 5C of the Banking Supervision Act, 1949 (Act No. 10 of 1949), the banking activities of non-scheduled banks are called non-scheduled banking activities.

As the Reserve Bank of India (RBI) is the central bank of India, all banks in India have to comply with RBI regulations.

1.7 Indian Public Sector Banks : An Overview

Public sector banks (PSBs) are commercial banks that are owned and managed by the Indian government. It is a crucial component of India's financial system and offers a variety of banking services to the public, corporations, and government.

- **History of Public Sector Banks in India :-**

The Imperial Bank of India was founded by the Indian government in 1921, marking the beginning of public service banks in India in the early 1900s.

- **Role of Public Sector Banks in India :**

- Provide financial services to the general public, especially low-income groups and rural residents.

- Mobilize funds and distribute them to profitable enterprises.

- Support government measures and policies aimed at reducing poverty and promoting financial inclusion.

- Promote development and economic prosperity.

- **Challenges faced by public sector banks :**

• Competition from non-banking financial companies (NBFCs) and private sector banks: These players have more cost-efficient structures and offer cutting edge products and services, hence competing fiercely with PSBs.

• High non-performing assets (NPA) levels: The profitability and financial stability of public sector banks is affected by higher NPA levels compared to private sector banks.

• Government interference: Public sector institutions are often subject to government interference, which may affect the institution's independence and decision-making capabilities.

• Lack of innovation: Public service institutions are often criticized for being slow to adopt new technologies and innovate, which may make them less competitive.

- **Public Banking Reform :**

To improve the effectiveness and efficiency of public service institutions, the Indian government has implemented the following changes:

• Mergers and amalgamations: In order to create bigger and stronger banks, the government merged several public service banks.

• Recapitalization: To strengthen the financial position of public service agencies, the government provides capital support.

• Governance Reforms: To enhance the autonomy and decision-making capacity of police agencies, the government implemented governance reforms.

• Embrace technology: Public service agencies have been asked to upgrade their digital infrastructure and adopt new technologies.

1.8 India's Banking Legislation :-

Indian banking law is governed by the Banking Supervision Act of 1949 and other Acts, including the Reserve Bank of India Act of 1934.

- **Important Banking Regulations :-**

• Banking Supervision Act, 1949 : This Act governs loans, cash reserves, assets and other topics pertaining to banks. The Banking Companies Act of 1949 was its original name.

• The Reserve Bank of India Act 1934, governs the Reserve Bank of India, which is responsible for issuing money.

• The National Infrastructure Development Finance Bank Bill, 2021 : This bill also modified India's banking regulation.

- **Recent changes in banking laws :-**

• The Banking Laws (Amendment) Bill, 2024: The measure will amend the Reserve Bank of India Act, 1934, the Banking Supervision Act, 1949, and other acts. Under the proposed bill, four account holders should be allowed per bank account instead of one.

- **Digitalization and Banking Law :-**

• As financial services become increasingly digital, banking law is evolving to address new issues such as data privacy and cyber security.

1.9 Current Scenario of Indian Banking Industry :-

- **Digitalization Growth :-**

With programs like UPI (Unified Payments Interface), digital banking penetration has exploded in India. The nation's acceptance of digital payments has significantly increased as a result of this. UPI transactions totalled over INR 140 trillion in FY24, a 70% increase from the year before.

- **Fintech Collaboration :-**

Traditional banks and fintech companies are working together to enhance the client experience. To expedite the payment process, for instance, banks are working with fintech firms like PhonePe, Razorpay, and Paytm.

- **Public Sector Banks (PSBs) :-**

Public sector banks have experienced major reforms and have received funding from the government to increase operations and enhance asset quality. Public sector

banks continue to control the market even though asset quality has improved as a result of the sale of non-performing assets.

- **Private Sector Banks :-**

  Banks like HDFC, ICICI, and Axis Bank did well because of their solid capitalisation, low non-performing assets (NPAs), and enhanced digital banking client experience.

- **Reducing non-performing assets and improving asset quality :-**

  Improved non-performing asset management: The Reserve Bank of India has implemented a number of instruments, such as the Insolvency and Bankruptcy Code (IBC), to assist in the resolution of non-performing assets (NPAs). According to the most recent data, Indian banks' gross non-performing assets (NPA) ratio was approximately 3.9% as of Q2FY24, which is lower than it was the year before.

  Improving asset quality : Efforts by private and public banks to improve asset quality have been successful, but challenges remain, especially in corporate lending.

- **Regulatory reforms and supervision :-**

  The supervisory function of the RBI : The RBI is still putting measures in place to make the banking industry more resilient, such as Basel III capital standards and routine systemic risk monitoring.

  Bank mergers and consolidation : It is anticipated that there will be 12 public banks by 2024, down from 27 in 2017, as a result of the government's aggressive consolidation efforts. Building more robust and well-capitalized institutions is the aim.

- **New Digital-only Financial Institutions and Neobanks :-**

  Neobanks : India is heading towards a totally digital banking future with the emergence of neobanks like Fin Box, RazorpayX, and Open. The goal of these neobanks is to give customers—particularly millennials and small businesses—an improved mobile-first experience.

- **Impact of Global Trends :-**

Interest rates and inflation: Lending and deposit rates in India are being impacted by rising interest rates as well as worldwide inflationary trends. Interest rate changes have been made by the Reserve Bank of India to strike a balance between managing inflation and economic growth.

- **The Environmental, Social, and Governance (ESG) aspects of sustainability include :-**

ESG is being pushed : Indian banks are progressively integrating ESG principles into their lending procedures. Sustainability is becoming a prominent topic as investors worldwide place a greater value on it.

Notwithstanding challenges including the decline in non-performing assets and the unpredictability of the world economy, the Indian banking industry has been growing gradually. However, the banking sector may become stronger, more resilient, and more customer-focused as a result of the quick developments in technology, financial inclusion, and regulation.

1.10 The significance and perception of performance :-

The verb "perfourmen" (which means "to do" or "to deliver") is the root of the word performance. It explains the action-taking procedure. It signifies that an action has been finished or carried out. It explains how much of a task has been finished.

The bank's development is taken into account. "Performance" refers to the endeavours undertaken to accomplish a goal successfully and efficiently. The coordinated use of human, financial, and natural resources is necessary to accomplish a goal (Albanese, 1978).

Kohlar (1979) defined performance as a broad term that refers to all or a portion of an organization's actions across time, typically in relation to previous or anticipated cost, efficiency, control, responsibility, or similar criteria.

From the two definitions given above, it is clear that performance encompasses not only the mode of expression but also the quality consciousness and final outcome attained by the company's management. Using the goals, objectives, and targets that management has set, it compares the performance of the present with that of the

past. As a result, the term "performance" is used to characterise how successful or unsuccessful a business is.

1.10.1 What Financial Performance Means :-

Financial performance is a reflection of the outcomes of financial activity. Financial performance demonstrates how well monetary objectives or aims are met. A company's financial success is measured in monetary terms for decision-making purposes. A company's financial performance during a given time period indicates its financial health. Financial performance analysis, then, is the process of methodically using financial statement analysis to accurately, critically, and comparably evaluate a business's financial status and profitability.

1.11 Banking Performance Evaluation : An Overview

The process of evaluating a bank's overall stability, effectiveness, risk management, and financial soundness is known as bank performance review. Stakeholders including investors, regulators, and management can use this assessment to determine the bank's capacity to fulfil its financial commitments, maintain growth, and function efficiently in a highly competitive market. A thorough analysis of several key performance indicators (KPIs), such as financial ratios, asset quality, capital sufficiency, risk management, and liquidity, is typically part of the review process.

A key component of this assessment is financial performance, which examines how well a bank makes money and manages its spending. While profitability is gauged by metrics like return on equity (ROE), return on assets (ROA), and net interest margin (NIM), cost-to-income ratios assess operational efficiency. An assessment of the bank's loan portfolio and the computation of credit risk and default provisions using measures like non-performing loans (NPLs) and loan loss provisions are also necessary for evaluating asset quality.

Additionally, the capital adequacy ratio (CAR), a gauge of a bank's loss tolerance, is taken into account in the examination. The capital adequacy ratio (CAR) is typically used to express this. Liquidity management is essential to a bank's capacity

to fulfil short-term obligations, and key metrics like the Loan-to-Deposit Ratio (LDR) and Liquidity Coverage Ratio (LCR) demonstrate financial soundness. Risk management focusses on how a bank efficiently detects, measures, and lowers different risks, including credit and market risks, using instruments like stress testing and risk-adjusted return on capital (RAROC).

Finally, to ascertain the bank's competitive position and capacity to draw in and hold on to clients, market position and customer satisfaction must be assessed. Operating within a legal framework, the bank manages regulatory risk by following guidelines like Basel III regulations and the CAMEL model. The overall objective of bank performance evaluation is to give stakeholders a thorough grasp of the bank's financial health, risk management, and long-term viability so they can make wise choices about strategic management, investment, and oversight.

1.11.1 Importance of Banking Sector in Economy :-

A nation's economic progress depends on the banking industry's ability to enable the flow of credit and capital. The primary engines of economic growth—investment, consumption, and infrastructure development—are supported by the vital financial services that banks offer. By extending loans and encouraging the growth of sectors like manufacturing, agriculture, and services, banks contribute to the upkeep of a robust economy. The banking industry stimulates economic activity by increasing credit, which propels long-term economic growth, according to the Reserve Bank of India's annual report.

Banks contribute to the growth of national savings by channelling resources into lucrative initiatives in addition to offering credit. Banks provide a range of financial products, including savings accounts and fixed deposits, which are crucial for funding long-term investments. The World Bank highlights how crucial the banking system is to raising national savings and effectively distributing capital for economic expansion. By encouraging deposits and making sure that money is effectively turned into investments, banks support economic expansion.

Decisions about monetary policy are also heavily influenced by banks. By regulating interest rates and altering liquidity, banks assist central banks in managing inflation, stabilising currencies, and preserving overall economic stability. The Reserve Bank of India's Monetary Policy Report states that banks play a key role in putting policies into place that control the money supply and affect the state of the economy. Additionally, the banking sector supports financial inclusion by providing services to underserved people, particularly in rural regions, through programs like the Pradhan Mantri Jan Dhan Yojana (PMJDY), which attempts to enhance access to banking services.

By lending money to start-ups and small enterprises, the banking sector also encourages entrepreneurship and the creation of jobs. This assistance will encourage economic diversification, job development, and innovation. The National Bank for Agriculture and Rural Development (NABARD) has emphasised how its agricultural and rural credit programs may assist entrepreneurs, particularly in rural India, in an attempt to promote economic development. Banks help companies and keep the financial system stable by managing liquidity, lowering risk, and preserving trust during emergencies.

Lastly, India's financial services have changed due to the digital revolution in banking, becoming more effective and easier. Digital wallets, online transactions, and mobile banking have all helped banks promote financial inclusion, particularly in underserved areas. A National Payments Corporation of India (NPCI) research claims that digital payments are expanding and benefiting the Indian economy. In conclusion, resilience, stability, and economic growth—particularly in India's evolving financial landscape—depend heavily on the banking industry's support of lending, savings, financial inclusion, and innovation.

1.11.2 Necessity of Performance Evaluation :-

Maintaining the financial stability and efficient operation of banks depends heavily on bank performance review. Banks can detect possible

shortcomings such high non-performing assets (NPAs) and insufficient capital and put corrective measures in place to reduce risks by regularly evaluating key indicators. To keep the bank solvent during recessions and shield it from financial shocks, this is crucial.

Enhanced operational efficiency is an additional advantage of performance evaluation. By evaluating transaction volumes, costs, and resource utilisation, banks may improve customer service, cut down on administrative costs, and streamline procedures. As a result, banks are able to lower costs and enhance customer service as the market grows more lucrative and competitive.

Strict regulatory guidelines have been established by central organisations like the Reserve Bank of India (RBI) for banks to adhere to. Performance reviews guarantee adherence to capital adequacy, liquidity, and risk management regulations. In addition to ensuring that banks are operating legally, these assessments assist banks in preserving the trust of investors and depositors.

Another crucial element of performance evaluation is efficient risk management. Credit risk, market risk, liquidity risk, and operational risk are just a few of the hazards that banks deal with. Organisations can develop measures to prevent any negative consequences by identifying and evaluating these risks through periodic assessments. To lessen the impact of a downturn in a certain industry, banks can, for instance, diversify their portfolios by assessing the concentration of loans in that area.

Lastly, evaluations of performance offer useful data to guide strategic decision-making and development. Banks can decide whether to expand services, embrace new technologies, or enter new markets by evaluating customer happiness, profitability, and overall performance. By doing this, the bank may maintain its performance even in challenging economic times, promoting long-term expansion, boosting client confidence, and boosting profitability.

1.11.3 Obstacles in assessing the banking industry's performance :-

Notwithstanding the challenges, evaluating the performance of the banking industry is essential to preserving financial stability. One major problem is the intricacy of financial indicators. A variety of criteria, such as capital adequacy, liquidity, and profitability—all of which are frequently connected—must be used to evaluate banks. Experience is necessary to properly comprehend this data, and a poor interpretation could result in poor decisions and endanger the bank's overall stability.

NPAs (non-performing assets) present another difficulty. This could be a sign of low asset quality. It is challenging to calculate non-performing assets (NPAs) accurately because of things like loan restructuring and late repayments. Since mismanaged non-performing assets (NPAs) have long-term effects on capital reserves and profitability, their true impact on bank stability typically necessitates ongoing monitoring.

Complexity is increased by regulatory and compliance concerns. A multitude of constantly evolving laws, including Basel III and anti-money laundering guidelines, apply to banks. Key performance indicators are subject to frequent regulatory changes, which makes it challenging to track consistent performance over time and adds to the compliance cost during evaluation periods.

Performance evaluation is now more complicated due to changes in the sector and technological advancements. The profitability and risk exposure of banks can be impacted by economic swings like inflation and interest rate changes. Similarly, the emergence of fintech and digital banking is altering consumer demands and the competitive environment, which makes the valuation process more complicated because it is hard to measure and forecast the long-term profitability of these technological advancements.

Evaluating the performance of banks with global operations and cross-border transactions is challenging due to regional variations in regulatory frameworks, currency volatility, and geopolitical challenges. It takes a deep comprehension of global marketplaces and the capacity to efficiently compile performance data to manage so many variables. Performance

measurement is essential to guaranteeing the safety, efficacy, and long-term growth of banks in spite of these obstacles.

1.12 Why Performance Analysis is Essential :-

For many stakeholders who assess the business environment and make decisions based on financial data, bank performance analysis is crucial. Management employs performance analysis, for instance, to assess internal controls and policies in order to decide whether to stick with the current plan or make adjustments in order to enhance the operational and financial performance of the business.

Creditors are particularly concerned about a company's liquidity. A company's ability to fulfil its short-term obligations can be ascertained through performance analysis. Two financial ratios that assist creditors in assessing a company's liquidity and overall financial status are the quick ratio and the current ratio. These ratios are crucial for ensuring on-time payments and lowering risk.

The Reserve Bank of India (RBI) and the government have taken a more comprehensive approach, concentrating on the overall performance of these industries, given the significant influence that companies like banking have on the economy. By examining bank performance, forecasting future events, and modifying policies to promote growth or lower risks in the financial sector, they can evaluate the nation's economic status.

Investors closely monitor a company's profitability, revenue stability, and growth potential. To make judgements about the company's financial health, they forecast present and future revenues using performance analysis. This enables investors to evaluate risk and ascertain the long-term viability of their assets.

Lastly, other stakeholders including employees, bondholders, unions, and depositors benefit from performance analysis as well. Cash flow, liquidity, and profitability are the top priorities for bondholders and savers in order to guarantee the safety and profitability of their investments. Because profits have a direct impact on pay, benefits, and job security, workers and unions are worried about the company's ability to turn a profit. Solvency and financial stability are factors that long-term lenders (like capital providers) consider in order to support businesses' long-term growth and success.

1.13 Performance Analysis : Applicability to Manage Tasks

Among the many tasks performed by a manager who has continuous access to both quantitative and qualitative data are planning, regulating, leading, and making decisions. These responsibilities demand a constant flow of data, which gives managers the ability to forecast, mould, and modify the course of corporate operations. To gather the information required to support these tasks, performance analysis is essential for management to plan future actions and make well-informed decisions.

Planning is a crucial managerial process that includes deciding on a company's future course of action. In order to establish clear goals and objectives, adequate information is required. Important information from performance analysis aids managers in forecasting future events and modifying operations appropriately. It backs up management's choices about corporate growth, resource allocation, and other crucial business plans.

Furthermore, performance analysis is necessary to keep effective management over everyday activities and achieve optimal efficiency. Management can direct human resource efforts and modify operations through performance analysis to guarantee that the business meets its set objectives. Additionally, having a strong knowledge base aid in decision-making, which promotes more lucrative operations and effective use of corporate resources.

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CHAPTER :- 2

CONCEPTUAL FRAMEWORK OF THE CAMEL MODEL & SAMPLE PROFILE OF BANKS

INDEX

2.1 What are frameworks in research ?

The problem, variables, and their expected relationships within the study area are defined by a conceptual framework, which is a systematic system of concepts, assumptions, and relationships that helps researchers clearly explain their research focus and how they plan to investigate it. In other words, a conceptual framework serves as a "map" to guide the research process.

A conceptual framework is a fundamental structure used in research that aids in directing the entire investigation. A clear road map for tackling the research challenge is provided by identifying the important variables, concepts, and connections between them. By relating theoretical concepts to the research issue, the framework guides the formulation of hypotheses, the design of the technique, and the interpretation of the findings. It basically organises and clarifies the main ideas and their connections, setting the stage for the study.

Generally speaking, the theoretical underpinnings of conceptual frameworks are derived from pre-existing ideas or models found in the literature. The study's foundation is provided by these ideas, which explain or forecast the relationships between variables or concepts. The framework describes the relationships between the important variables, including independent and dependent variables, in addition to defining them. It does this by offering a framework for comprehending how the research problem will be investigated and aiding in the formulation of research questions or hypotheses.

To prevent misunderstandings and guarantee accuracy in the study, key terms and variables in the framework must be precisely defined and described. The dependent variables are the results being impacted, whereas the independent variables are the elements influencing other variables. Other variables, such as control variables that aid in removing biases or confounding factors, might also be detected. For the purpose of directing data collection and analysis, these variables must be precisely defined.

With the help of the conceptual model, the links between the important concepts and variables are visually represented. Through the use of mediating factors, this model aids researchers in understanding how independent variables may affect

dependent variables. Through the visual mapping of these links, the framework serves as a tool for conceptualising the study's dynamics and providing insight into the anticipated interactions between variables.

The study's assumptions and boundaries are also described in a conceptual framework. A belief that is accepted without complete evidence is called an assumption. An example of this would be the validity of participant self-reporting. The term "delimitations" describes the parameters of the investigation, such as the study population, time period, or geographic reach. These components aid in defining the study's parameters and guarantee that the investigation stays controlled and targeted.

The research design and technique are greatly impacted by the framework. It aids in choosing the kind of information to be gathered, the methods for measuring variables, and the methods for analysing the information. Regardless of the study's methodology—qualitative, quantitative, or mixed—the conceptual framework guarantees that the research stays true to its theoretical underpinnings and gives the process of gathering and analysing data coherence.

The conceptual framework's consequences encompass both theoretical and practical contributions, to sum up. The framework may offer useful insights for practitioners in the subject and aids in defining how the research contributes to the body of knowledge. In order to address the research topic and guarantee that the study is based on accepted information, the conceptual framework integrates important ideas and variables. This helps to advance theory, practice, and future research directions.

2.2 CAMEL Model : An Overview

A crucial framework for evaluating the performance and health of banks in banking and financial analysis is the CAMEL Model. The terms capital adequacy, asset quality, management quality, earnings quality, and liquidity are all represented by the acronym. To give a thorough picture of a bank's financial stability, each of these elements is assessed separately. While asset quality looks at the probability of loan defaults, capital sufficiency gauges a bank's capacity to withstand losses. Earnings quality analyses the sustainability of profits, while management quality gauges how

well a leader is leading. The bank's capacity to handle financial shocks and short-term obligations is the main focus of liquidity.

Investors, analysts, and regulators can evaluate a bank's overall financial health with the use of this model. It offers information about how stable, effective, and resilient the organisation is to downturns in the economy. Stakeholders can identify possible threats by assessing these elements, guaranteeing the bank's ongoing security and performance. Making educated judgements about investments or regulatory supervision, as well as preserving confidence in the banking industry, depend on the model.

Sensitivity to Market Risk is an extra component that can be added to the CAMEL model to create the CAMELS model. This element evaluates a bank's susceptibility to outside influences such as shifts in interest rates or currency market volatility. All things considered, the CAMEL (or CAMELS) model provides a thorough method for assessing the health of financial institutions, making sure that both internal management and external market circumstances are taken into account.

2.3 CAMEL model in India :-

In India, banks' performance and financial health are assessed using the CAMEL model. Using this model, the Reserve Bank of India (RBI), the main regulatory body, keeps an eye on and evaluates the stability and soundness of banks in the public and private sectors. In addition to ensuring that banks function safely and soundly, the application of the CAMEL model helps identify areas for improvement and reduces systemic risks in the financial system.

1) **Capital Adequacy :-**

   In India, a key metric for evaluating a bank's capital strength is the Capital Adequacy Ratio (CAR). Indian banks are expected to maintain a minimum CAR of 9% in accordance with RBI norms; systemically important banks are subject to extra restrictions. The ability of banks to absorb possible losses without jeopardising their operations is thus guaranteed.

2) **Asset Quality :-**

A crucial indicator for assessing asset quality in India is the Non-Performing Assets (NPA) ratio. Indian banks are very concerned about high non-performing assets (NPAs), particularly in light of the economic difficulties brought on by loan defaults in industries including corporate lending, infrastructure, and agricultural. Through provisions and recovery mechanisms, the RBI collaborates with banks to lower non-performing assets (NPAs), which it constantly analyses.

3) Management Quality :-

Strong governance procedures, including efficient risk management frameworks and internal controls, are needed for Indian banks. The RBI is primarily concerned with evaluating the way banks handle their business, especially with regard to operational, market, and credit risk. Banks that have adequate management are able to adhere to regulations and make wise decisions.

4) Earnings :-

In India, indicators such as Return on Equity (ROE) and Return on Assets (ROA) are used to analyse the profitability of banks. For Indian banks, earnings quality is important as funding operations and creating capital buffers depend on ongoing profitability. Earnings in the banking industry frequently mirror the broader state of the economy, which affects interest rates, loan demand, and overall economic expansion.

5) Liquidity :-

Indian banks' liquidity is assessed by looking at their capacity to pay short-term debts. According to Basel III requirements, Indian banks are guaranteed to maintain sufficient high-quality liquid assets to withstand short-term liquidity crisis situations through the Liquidity Coverage Ratio (LCR). To guarantee that the financial sector has enough liquidity, the RBI manages liquidity.

2.3.1 Importance of CAMEL in India :-

India's broad and sizable banking industry makes the CAMEL model, a thorough framework for assessing banks' financial performance and health, especially

significant there. Capital adequacy, asset quality, management quality, earnings, and liquidity are the five main criteria it uses to evaluate banks. These factors are crucial for figuring out the stability, effectiveness, and hazards of the banking system. Every metric offers important information about how well a bank is doing and points out any hazards that might affect the financial system as a whole.

The capital adequacy ratio shows how well a bank can withstand losses and protect depositors. In order to prevent systemic risk and preserve stability during economic downturns, this ratio is essential for Indian banks, particularly in light of the rising non-performing assets (NPAs). Asset quality examines a bank's assets, especially its loans, to find faulty or hazardous loans that could jeopardise its financial standing. Maintaining high asset quality is essential to the banking industry's health in India, where non-performing assets (NPAs) have been a major problem.

Management quality assesses a bank's leadership, decision-making procedures, and internal controls. Because of cases of fraud and poor management, good management has grown even more important in India in recent years. Robust management and governance lower operational risks and support the bank's long-term viability. A bank's profitability is evaluated by the Earnings parameter; stable finances are indicated by strong earnings. Strong profits are crucial for Indian banks' financial well-being as well as for financing social programs and more general developmental initiatives.

Lastly, a bank's liquidity assesses its capacity to fulfil immediate obligations. Keeping cash on hand is crucial in India, particularly during uncertain or stressful economic times. Banks can control cash flow and avert financial crises if they have enough liquidity. The Reserve Bank of India (RBI) oversees and regulates banks using the CAMEL model, making sure they uphold strict criteria in each of these areas, which promotes investor trust and systemic stability.

To sum up, the CAMEL model is essential for evaluating the Indian banks' financial standing. It assists regulators in keeping an eye on risk, guaranteeing stability over the long run, and assisting banks in increasing operational effectiveness. The model encourages a more robust banking system by concentrating on the five factors, which is essential for the nation's economic development and progress.

Additionally, it promotes openness, which enables the public and investors to make well-informed choices about the soundness of the financial industry.

2.4 CAMEL Structure and Key Ratios :-

1. Capital Adequacy :-

One important metric for assessing the banking industry's financial health is capital sufficiency. Stakeholders have sufficient confidence in their capital security when there is high capital adequacy. A bank's ability to withstand unforeseen losses in the near future is demonstrated by its capital adequacy.

- Capital Adequacy Ratio (CAR) :-

$$\text{CAR} = \frac{\textbf{Tier I capital} + \textbf{Tier II capital}}{\textbf{Risk Weighted Assets}} * \mathbf{100}$$

Significance :- It gauges how well a bank can withstand losses from risky assets. A higher ratio indicates a bank's better financial standing.

Analysis :- It is better if the ratio is higher.

- Debt – Equity Ratio :-

This ratio is employed to quantify the financial leverage of the organisation. It shows how much debt is being used by the business to finance its assets.

$$\text{D/E Ratio} = \frac{\textbf{Total Liabilities}}{\textbf{Share holder's Equity}} * \mathbf{100}$$

Analysis :- The lower D/E ratio is preferable.

- Total Advance to Assets Ratio :-

The number of assets provided as advances is indicated by this ratio.

$$\text{Formula} = \frac{\textbf{Advances}}{\textbf{Total Assets}} * \mathbf{100}$$

Analysis :- It is better if advances represent a larger percentage of overall assets.

- Govt Securities to Total Investment :-

The most liquid and secure investments are government securities, whether they are issued inside or outside of India. This ratio calculates the bank's overall investment in government securities.

Formula = $\frac{\textbf{Govt Securities}}{\textbf{Total Investment}}$

- Shareholder's Fund to Total Advances :-

  This shows what percentage of all advances were funded by shareholders.

  Formula = $\frac{\textbf{Shareholder's Fund}}{\textbf{Total Advances}} * \mathbf{100}$

  Analysis :- The higher ratio is preferable.

- Shareholder's Fund to Total Assets :-

  Formula :- $\frac{\textbf{Shareholder's Fund}}{\textbf{Total Assets}} * \mathbf{100}$

- Return on Net Worth Ratio :-

  This ratio shows the amount of total assets that will remain with shareholders following the settlement of all liabilities.

  Formula :- $\frac{\textbf{Net Profit}}{\textbf{Shareholder's Fund}} * \mathbf{100}$

  Analysis :- The higher ratio is preferable.

- Leverage Ratio :-

  Formula :- $\frac{\textbf{Tier 1 Capital}}{\textbf{Total Assets}} * \mathbf{100}$

2. Asset Quality :-

Asset quality evaluates a bank's assets' degree of risk. The main metrics used to measure it are loan loss provisions and non-performing loans (NPLs).

- Non – Performing Loans (NPL) Ratio :-

  NPL Ratio = $\frac{\textbf{Non-Performing Loans}}{\textbf{Total Loans}} * \mathbf{100}$

- Provision Coverage Ratio :-

$$PCR = \frac{\textbf{Loan Loss Provision}}{\textbf{Non}-\textbf{Performing Loans}}$$

3. Management Quality :-

The efficiency and proficiency of a bank's management are assessed by management quality. Despite lacking a methodology, this measure can be evaluated using key performance indicators (KPIs) like :

- Return on Asset :-

$$ROA = \frac{\textbf{Net Income}}{\textbf{Total Assets}} * \mathbf{100}$$

- Return on Equity :-

$$ROE = \frac{\textbf{Net Income}}{\textbf{Shareholder}'\textbf{s Equity}} * \mathbf{100}$$

4. Earning Capability :-

The CAMEL model also includes the earning efficiency. The ability of a bank to sustain quality and generate regular profits is reflected in its earning quality. Earning efficiency provides insight into banks' earnings patterns and prospects. In addition to increasing public trust in the bank, a steady profit helps it absorb loan losses and make enough contingencies.

- Net Interest Margin :-

$$NIM = \frac{\textbf{Net Interest Income}}{\textbf{Average Earning Assets}} * \mathbf{100}$$

- Cost – to – Income :-

$$Formula = \frac{\textbf{Operating Expense}}{\textbf{Operating Income}} * \mathbf{100}$$

- Profitability Ratio :-

$$Formula = \frac{\textbf{Net Income}}{\textbf{Total Revenue}} * \mathbf{100}$$

5. Liquidity Capability :-

- Loan – to – Deposit Ratio :-

$$\text{LDR} = \frac{\textbf{Total Loans}}{\textbf{Total Deposits}} * \mathbf{100}$$

- Liquidity Coverage Ratio :-

$$\text{LCR} = \frac{\textbf{High Quality Liquid Assets (HQLA)}}{\textbf{Total Net Cash Outflow over 30 Days}} * \mathbf{100}$$

- Cash Ratio :-

$$\text{Formula} = \frac{\textbf{Cash+Cash Equivalents}}{\textbf{Total Liabilities}} * \mathbf{100}$$

- Quick Ratio :-

$$\text{Formula} = \frac{\textbf{Current Assets – Inventories}}{\textbf{Current Liabilities}} * \mathbf{100}$$

2.5 Top 5 Public Sector Banks of India :-

1. State Bank of India (SBI)

2. Bank of Baroda (BOB)

3. Punjab National Bank (PNB)

4. Union Bank

5. Indian Overseas Bank (IOB)

2.6 Sample Profile of Top 5 Public Sector Banks :-

2.6.1 Introduction :-

Give a succinct overview of the market capitalisation of the top public sector banks and why it is a significant consideration. Bring up the fact that market capitalisation gives information about how the market views banks' stability, future prospects, and financial health. Since market capitalisation is a measure of both size and investor trust, it is crucial to examine these banks in order to comprehend the general state of public sector banks in India.

2.6.2 Criteria For Selection of Banks :-

Explain the selection criteria used to determine the top five public sector banks by market capitalisation. Multiplying the current share price by the total number of outstanding shares yields the market capitalisation. The chosen financial institutions will be the biggest and most powerful public sector banks, which are expected to have a big influence on the financial system both at home and abroad.

2.6.3 Overview of Selected Public Sector Banks :-

Give a thorough analysis of each of the top five public sector banks according to their market capitalisation (as of the most recent data available). Each bank's profile ought to have the following information :

1. **State Bank of India :-**

   Since its founding in 1806 as the Bank of Calcutta, the State Bank of India (SBI) has grown to become the country's largest public sector bank. It was founded in 1955. SBI, which has its headquarters in Mumbai, has more than 22,000 branches throughout India and more than 200 abroad, giving it a substantial national and international presence. With a 57.4% ownership share, the Government of India is one of the most powerful entities in the Indian banking industry.

   Retail, business, investment, wealth, and asset management are just a few of the many banking services that SBI provides. With services for the Indian diaspora and involvement in trade finance and foreign exchange, it also has a significant global presence. The YONO app is one of its important digital banking efforts that has improved client experiences and service delivery.

   SBI has demonstrated good financial performance, as seen by its steady profitability and high Capital Adequacy Ratio (CAR) and Return on Equity (ROE). Although SBI has experienced difficulties with non-performing assets (NPAs), like many other banks, it has made proactive measures to address this by enhancing recovery methods and asset quality. The bank's varied revenue streams, which include interest and non-interest income, continue to show its resiliency.

Along with its commercial endeavours, SBI supports numerous government programs including the Pradhan Mantri Awas Yojana (PMAY) and Mudra Yojana and is a key player in financial inclusion. It plays a major role in facilitating India's economic development, especially in rural regions where it concentrates on offering banking services to marginalised communities. It is a cornerstone of India's financial stability due to its scale and scope.

Challenges for SBI include the need to continuously enhance digitalisation and NPA management, as well as growing competition from fintech firms and private banks. SBI has taken steps including cost optimisation, MSME finance, and partnerships with fintech to solve issues. Being the biggest lender in India, its financial performance is crucial to the overall health of the banking industry, which makes it a crucial topic for CAMEL model analysis of public sector banks.

2. Bank of Baroda (BoB) :-

The Bank of Baroda (BoB) is one of the biggest and most respected public sector banks in India. It was established in Vadodara, Gujarat, in 1908. It has grown both domestically and abroad throughout the years, now operating in over 20 nations. The bank is a major player in the nation's financial system and provides a broad variety of banking services.

Retail, corporate, SME, and international banking are among BoB's primary services. It offers services like wealth management, trade finance, credit cards, personal loans, and current and savings accounts. In an increasingly technologically advanced world, the bank also supports digital banking through online platforms and mobile apps, guaranteeing a smooth experience for clients. With operations in more than 100 countries, Bank of Baroda is present in well-known areas like the US, UK, UAE, Singapore, and China. Because of its global reach, the bank can serve both domestic and overseas clients, making services like remittances and foreign currency easier.

Significant changes have been made to Bank of Baroda in recent years, including a 2019 merger with Dena Bank and Vijaya Bank to build a more powerful public sector organisation. To stay up with technology, the bank has

also prioritised digital innovation, introduced AI-powered products and improved its online banking offerings.

Additionally, Bank of Baroda is dedicated to corporate social responsibility, implementing programs in rural development, healthcare, and education. The bank is committed to being innovative and customer-focused, and it is working to improve its standing in both domestic and international markets while boosting India's economy.

3. Punjab National Bank (PNB) :-

One of the biggest and oldest public sector banks in India is Punjab National Bank (PNB), which was established in 1894 and has its main office in New Delhi. With more than 10,000 offices throughout India and a number of foreign countries, PNB provides a broad variety of financial services to both individual and business customers. The bank has played a significant role in forming the banking environment in India by consistently coming up with new ideas to satisfy the demands of its wide range of clients.

In addition to corporate banking (trade finance, business loans), PNB offers retail banking (credit cards, home loans, and savings accounts), SME banking (specialised financial solutions), and wealth management (mutual funds and investment advice). In order to meet the increasing demand for tech-enabled financial solutions, the bank has also adopted digital banking and made online services like internet banking, UPI, and mobile banking available.

The bank now has branches in important foreign markets, such as the US, UK, UAE, Hong Kong, and Afghanistan, further enhancing its global reach. PNB is able to provide services including trade finance, remittances, and foreign exchange to clients worldwide because of its global presence. More accessibility and convenience are ensured by PNB's digital banking activities, which also concentrate on offering consumers smooth online and mobile banking services.

PNB formed a bigger and more competitive banking organisation in 2020 by merging with United Bank of India and Oriental Bank of Commerce. PNB's

position in the Indian market has been reinforced by this calculated decision, and the company's emphasis on digital transformation is still enhancing customer satisfaction and operational effectiveness. The bank has received recognition for its innovative and superior customer service contributions to the banking industry.

With an emphasis on rural development, healthcare, and education, Punjab National Bank is still dedicated to its CSR programs. As a customer-focused organisation, PNB wants to improve its digital capabilities, increase its domestic and global footprint, and keep promoting financial inclusion and the expansion of small and medium-sized businesses (SMEs) throughout India.

4. Union Bank :-

The Union Bank of India (UBI), one of India's top public sector banks, was established in 1919 and has its main office in Mumbai, Maharashtra. Retail, corporate, SME, wealth management, and digital banking are just a few of the many financial services that UBI offers through its more than 8,000 branches throughout India and its global footprint. With a history spanning more than a century, the bank is still vital to the growth of the Indian banking industry.

While UBI offers working capital finance, company loans, and trade finance in its corporate banking products, its retail banking services include credit cards, home loans, personal loans, and savings accounts. Along with wealth management products for high-net-worth individuals (HNWIs), the bank offers customised financial services for small and medium-sized businesses (SMEs). To improve customer transactions' convenience and security, UBI has implemented online banking, mobile banking, and UPI services as part of its digital transformation.

In order to provide services like foreign exchange and global trade finance, the bank has increased its presence abroad by opening offices in strategic places like the US, UK, UAE, Hong Kong, and Australia. Its 2020 merger with Andhra Bank and Corporation Bank improved its competitiveness in the Indian market and made it a more diversified organisation that can provide its clients with better services.

UBI has received praise for its dedication to expansion, innovation, and client service in a number of financial industries. In an effort to better the lives of underprivileged populations in India, the bank has also been actively involved in corporate social responsibility (CSR) programs that concentrate on environmental sustainability, healthcare, education, and rural development.

Union Bank of India's future goals include strengthening its digital banking skills, growing both domestically and abroad, and promoting financial inclusion. In addition to helping India's economy grow, the bank is well-positioned to realise its goal of becoming a preeminent international financial institution thanks to its strong legacy, wide variety of services, and customer-centric attitude.

5. Indian Overseas Bank (IOB) :-

An important public sector bank in India is Indian Overseas Bank (IOB), which was founded in 1937 and has its main office in Chennai, Tamil Nadu. Having been in the Indian banking industry for more than 80 years, IOB has made a name for itself by offering a variety of financial services to people, corporations, and businesses. With more than 3,500 branches throughout India, the bank maintains a significant local presence. Globally, it has grown to important places including the US, UK, Singapore, and Hong Kong.

IOB serves a wide range of clients by providing a range of services, such as wealth management, corporate banking, retail banking, and SME banking. The bank offers basic retail banking services like credit cards, loans, and current and savings accounts. It provides cash management, trade finance, and working capital financing for companies. To guarantee safe and practical banking for its clients, IOB is also committed to improving its digital banking platforms, providing internet, mobile, and UPI services.

The bank has been spending heavily in its digital transformation, with a particular emphasis on improving the speed, security, and accessibility of banking services. In addition to its digital banking efforts, IOB has been improving its financial standing by resolving non-performing assets (NPAs) and obtaining funds to fund expansion in the future. The bank has set itself up for

long-term, sustainable prosperity by concentrating on strengthening its financial situation.

IOB conducts a number of projects as part of its corporate social responsibility (CSR) with the goal of enhancing environmental sustainability, healthcare, education, and rural development. Through a number of community outreach initiatives, the bank has been committed to fostering skill development and aiding in the socioeconomic advancement of marginalised populations.

In the future, Indian Overseas Bank wants to improve the quality of its assets, increase the scope of its digital services, and fortify its global footprint. IOB is in a strong position to continue playing a significant role in the Indian banking sector and advancing the country's economy because to its customer-centric strategy, dedication to innovation, and ongoing emphasis on financial inclusion.

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CHAPTER :- 3

LITERATURE REVIEW

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3.1 INTRODUCTION :-

A literature review is a critical evaluation and synthesis of previous studies on a certain subject. It summarises the state of knowledge at the moment, points out knowledge gaps, and emphasises significant discoveries in the literature. Writing a literature review is a crucial skill for effective research. The capacity to condense and integrate prior information on a subject shows knowledge of the subject and facilitates learning.

The literature review chapter's goal is to present a thorough analysis of the body of knowledge regarding the study issue. By critically assessing the theories, concepts, and methodologies that form the basis of the current research, this chapter establishes the groundwork for the investigation. The review places the current study within broader scholarly discussions, identifies important trends, controversies, and gaps in the literature, and emphasises the contributions of earlier research to the subject.

The theoretical framework directing the investigation is described at the beginning of this chapter, along with explanations of important terms and concepts required to comprehend the research environment. Next, with an emphasis on their methodologies, conclusions, and ramifications, the review highlights and evaluates significant research that has impacted the discipline. Finding trends, disagreements, and open questions in the literature is the goal of this chapter's analysis.

The reader will have a thorough awareness of the body of existing knowledge, the methodological strategies used in earlier research, and the gaps that this study aims to fill after reading this review. Each of the numerous thematic sections that make up this review addresses a distinct facet of the literature that is pertinent to the research question and the goals of the study.

3.2 Purpose of Literature Review :-

By giving you a foundational understanding of the research issue, a literature review is essential to setting the groundwork for your study. It sheds light on earlier studies, underlying theories, and new developments in the subject while also helping to situate the current investigation within a larger academic framework.

Understanding the significance of this study and its position in the current scholarly discussion requires this contextualisation.

Finding gaps in the body of existing research is the main goal of a literature review. Through a critical analysis of previous research, the review identifies knowledge gaps, contradictions, and areas of uncertainty. In addition to demonstrating how the current study will provide fresh perspectives and close gaps in the corpus of existing knowledge, this identification of gaps supports the necessity of the current investigation.

A literature review not only identifies gaps but also synthesises previous research and makes links between various concepts, conclusions, and methodologies. By identifying similar themes, trends, and variances within the field, this synthesis gives the researcher a more thorough grasp of the subject. This aids in identifying points of agreement or disagreement that could inspire additional research.

Your research questions and hypotheses can also be improved with the aid of a literature review. Examining previous research enables researchers to pinpoint unanswered questions and narrow the study's emphasis. By ensuring that the study tackles original and pertinent issues that haven't been sufficiently explored in the literature, this procedure eventually raises the study's significance and originality.

Lastly, the study's theoretical and methodological framework was made clearer by the literature review. By looking at the approaches and theories employed in earlier research, this review helps choose the best techniques for data gathering and analysis. Additionally, it gives the study's theoretical foundation, sets the framework for carrying out and evaluating the investigation, and exhibits the researcher's breadth of expertise and authority in the topic.

3.3 Reviews of Related Research :-

(B.Chintala & M.Syed, 2012) The study looks at how Indian public sector banks performed between 1999–2000 and 2008–2009, concentrating on how new financial products affected their bottom line. By contrasting the financial environment before and after the launch of new financial products in the banking industry, the study reveals a significant change in the financial landscape. The results indicate that public sector banks' financial performance improved

considerably during the new financial products period, surpassing the old financial products period. This change emphasises how new financial products help Indian public sector banks become more profitable and efficient.

(R.Sangeetha, 2013) The study looks into the technological efficiency of Indian public sector banks, with a particular focus on the years 2008–09–2010–11, which were characterised by shifts in technology, regulation, and competition in the global financial services sector. With interest costs and operational expenses as input factors and interest revenue and other income as output variables, the study employs Data Envelopment Analysis (DEA) to assess the effectiveness of 26 public sector banks. The results show that during the study period, Corporation Bank, State Bank of India, and IDBI Bank continuously shown great efficiency. For stakeholders including depositors, investors, managers, and policymakers, this study emphasises the significance of assessing technical efficiency since it offers vital information about the stability, sustainability, and profitability of the Indian banking sector.

(Yasir & Anis, 2015) An increasingly complicated financial system is the result of the banking industry's tremendous expansion, which has made it one of the fastest-growing sectors in the world. The CAMEL Rating system is one of the most popular instruments for assessing the capital adequacy, asset quality, management ability, earnings ability, and liquidity of financial institutions. A variety of evaluation models are used to evaluate the performance of banks. When evaluating the performance of banks in the public and private sectors, this approach is very pertinent. Data from annual reports from 2008–09 to 2012–13 were utilised in a study that compared the performance of Axis Bank and Kotak Mahindra Bank in the private sector with that of Bank of Baroda and State Bank of India in the public sector. The CAMEL model parameters were used to analyse the ratios that were computed for each bank in the study. After that, each parameter was given a weight depending on its significance, and the banks' performance in each parameter was used to determine how many marks they received. A thorough evaluation of the banks' financial health was provided by adding up the scores from each criterion to determine their final ranking.

(C.Balaji & G.Praveen, 2017) In India, the main goal of the banking sector reforms has been to increase the banks' profitability and efficiency, which has allowed new

private sector banks to open. With a focus on the years 2011–12–2015–16, this study examines the performance of banks in the public and private sectors using CAMEL metrics. The sample consists of three major public sector banks (State Bank of India (SBI), Bank of Baroda, and Punjab National Bank) as well as three major private sector banks (HDFC Bank, ICICI Bank, and Kotak Mahindra Bank). The results show that while the chosen private sector banks have lower net NPA/NA and business per employee, they perform better than their public sector counterparts in important financial indicators such capital adequacy ratio, profit per employee, return on assets, and current ratio. These findings highlight how private sector banks do better financially than public sector banks, especially when it comes to efficiency and profitability.

(S.Swati & P.Ishani, 2018) The financial performance of a few public and private sector banks in India is assessed and contrasted in this study, highlighting the significance of gauging bank soundness in order to promote sustainable growth in the nation. Based on information from the CAMEL model indicators for the years 2014–2017, the study comprises a sample of 30 banks, 15 of which are in the public sector and 15 of which are in the private sector, chosen based on Money Control's financial ratings. To compare the banks' performance, the analysis uses the Mann-Whitney U test, t-test, and ranking. According to the results, private sector banks perform better than public sector banks on every CAMEL metric, whereas public sector banks show less financial soundness. The study has both theoretical and practical ramifications: it points out the causes of public sector banks' subpar performance and makes recommendations for improvement, laying the groundwork for further comparative research. Using both parametric and non-parametric hypothesis testing procedures within the well-known CAMEL paradigm, this study is unusual in its thorough comparison.

(V.Srija & Dr.Kushwaha, 2018) This study compares the performance of a few Indian public and private sector banks using the CALS Rating model, which assesses liquidity, profits potential, managerial competency, asset quality, and capital adequacy. Covering data from annual reports from 2010–11 to 2016–17, the study focusses on Axis Bank and Kotak Mahindra Bank from the private sector and Bank of Baroda and State Bank of India from the public sector. The CALS model

was used to create a number of financial ratios for each bank, and each parameter was given a weight according to its significance. The banks were then given scores and rankings based on the weighted results, providing a clear evaluation of their respective performance. This method gives stakeholders and regulators important information into how various banking institutions perform across important financial metrics.

(Mahesh & Deepak, 2019) The banking industry has grown significantly, ranking among the fastest-growing in the world, necessitating the use of efficient performance measurement techniques. The CAMEL Rating system is one of the most used instruments for evaluating financial institutions, especially commercial banks. It looks at factors like liquidity, earnings ability, managerial capability, asset quality, and capital adequacy. The CAMEL model has been used in numerous studies to compare the performance of banks in the public and private sectors. Using data from annual reports from 2013–14 to 2017–18, a study comparing the private sector's Axis Bank and Kotak Mahindra Bank with the public sector's Bank of Baroda and State Bank of India found that both maintain capital adequacy. Private sector banks are more profitable and have greater earnings potential, but public sector banks have more Non-Performing Assets (NPAs), which makes asset management extremely difficult. Furthermore, it was discovered that the two sectors' liquidity metrics were equivalent, suggesting that the financial stability of these sectors was comparable.

(Nandhini, 2019) Indian banks are mostly categorised according to ownership patterns. Twenty nationalised banks and six SBI & Associates institutions are categorised as public sector banks, whereas thirteen old private banks, seven new private banks, and forty-six foreign banks are classified as private sector banks. In addition, there are industrial development financial institutions, rural banks, and development and cooperative banks. Among these, nationalised banks are regarded as the largest and most powerful entities in the banking industry and are acknowledged as being essential to the nation's economic growth and national revenue. It is crucial to assess the performance of nationalised banks because of their important role in the economy. These banks' performance is frequently examined using the CAMEL model rating, which evaluates capital sufficiency, asset

quality, managerial capability, earnings ability, and liquidity. This rating offers important information about the banks' financial stability and role in economic expansion.

(R.Vethamuthu, 2019) The study looks into how asset quality affects the financial performance of Indian banks, both public and private, with an emphasis on important financial metrics including solvency, profitability, liquidity, and efficiency. As credit risk increased following the global financial crisis of 2007–2008, asset quality became a crucial concern for Indian banks, particularly when a sizable amount of non-performing assets (NPAs) surfaced, endangering their stability. A range of financial ratios are used in this study, which spans the years 2005–2014, to evaluate how asset quality affects bank performance. ANOVA, regression analysis, descriptive statistics, and correlation were among the statistical tools used to analyse a sample of 46 banks, comprising 20 private sector banks and 26 public sector banks. The report emphasises how important asset quality management is to preserving both operational effectiveness and financial stability in the banking industry.

(Jagdish.R, 2020) Examining banks' financial performance is crucial since they serve as a bridge between savers and borrowers, contributing significantly to a nation's economic growth. The CAMEL model, which evaluates banks' financial soundness using five essential elements—capital adequacy, asset quality, management, earnings, and liquidity—is used in this study. The study examines a few Indian public sector banks during a ten-year period, from 2009–10 to 2018–19: Bank of Baroda, Bank of India, Central Bank of India, Punjab National Bank, and Canara Bank. By offering insightful information on these banks' long-term performance and soundness, the study emphasises the significance of applying the CAMEL model to assess and guarantee their financial stability.

(T.Jyoti & Dr.Shivappa, 2020) The banking industry is essential to India's economic development, and as the country's public sector banks must satisfy Basel III standards and the demand for capital rises, it is more important than ever to draw in investors and protect shareholder wealth. Before making an investment, a logical investor assesses banks' entire performance according to their profitability, managerial effectiveness, goodwill, growth pace, and long-term sustainability. A

useful method for evaluating a bank's financial soundness is the CAMEL model, which evaluates a bank's performance using a number of ratios in the areas of capital adequacy, asset quality, management, earnings, and liquidity. This study uses the CAMEL model to assess the financial performance of a limited number of Indian private and public sector banks over a four-year period (2011–12 to 2014–15). Public sector banks perform better in terms of liquidity and management capability during the research period, whereas private sector banks perform better in terms of capital sufficiency, earnings capability, and asset quality.

(M.Raman & C.Jayshankar, 2020) An economy's financial stability depends on the assessment of its banking industry, particularly in the wake of international banking crises. One of the most important instruments for determining the safety and soundness of banks is the CAMEL model, which evaluates capital adequacy, asset quality, management effectiveness, earnings, and liquidity. With an emphasis on important financial metrics like net margin, total assets, and market position, this study looks at the financial performance of the top ten public and private sector banks in India over a five-year period from 2015 to 2020. According to the findings, private sector banks have proven to be competitive with public sector banks in terms of capital adequacy, asset quality, and management effectiveness. The study analyses the performance of the chosen banks using a variety of financial ratios and statistical methods, as well as secondary data from their financial statements. In order to assess these banks' overall financial health, the study emphasises the significance of keeping an eye on important metrics such demand deposits, business per employee, net non-performing assets, debt-to-equity ratio, and liquid assets.

(G.Nishant, 2020) The research compares a few Indian public and private sector banks to examine how the capital adequacy ratio affects operating performance, profitability, and return ratios. Descriptive analysis, independent sample t-tests, and simple regression were used in the study to evaluate panel data from twelve Indian banks over a ten-year period (2014–2023), comprising six public and six private sector banks. According to the results, private sector banks perform better than public sector banks in terms of lending practices, asset quality, efficiency, and financial performance. This suggests that in order to be competitive with private

sector banks, public sector banks must implement more effective procedures and strengthen their financial standing.

(Ashok, 2021) The CAMEL method is a useful instrument for assessing banks' financial health and determining what needs to be done to strengthen their areas of weakness. Following the suggestions of the Padmanabham Working Group (1995), the Reserve Bank of India (RBI) implemented this strategy in 1996. 25 public sector banks, 18 private sector banks, and 8 foreign banks make up the sample for this study, which attempts to rank different commercial banks doing business in India. The CAMEL model was used, taking into account important factors like liquidity, management effectiveness, asset quality, capital adequacy, and earnings quality. The study's conclusions showed that, among public sector banks, Canara Bank performed the best, followed by State Bank of India and Punjab National Bank. On the other hand, Bank of India and Bank of Baroda were rated as having the worst financial performance.

(Apoorva & Akansha, 2021) Public sector banks are essential to the nation's financial infrastructure, and the Indian banking industry has undergone substantial change. Studies show that public sector banks have significantly improved their efficiency, sophistication, and consolidation, making significant contributions to the Indian financial system. The 1979-developed CAMEL Model, which assesses important factors like capital adequacy, asset quality, management efficiency, earning quality, and liquidity position, has been used to analyse the financial performance and position of significant public sector banks, including the State Bank of India, Union Bank of India, Canara Bank, and Punjab National Bank, after mergers (Author, Year). To evaluate and rate these banks' financial performance, the study used statistical tools such as ratios, averages, ranks, and percentages. These assessments are essential for comprehending the robustness of these establishments and their economic benefits (Author, Year). The results indicate that these mergers have improved these banks' competitiveness and performance in the changing market.

(Prof.Sharma & J.Gautam, 2021) In this study, the financial performance of two prominent Indian banks—the public State Bank of India (SBI) and the private ICICI Bank—is compared with an emphasis on the years 2016–2020. Return on Equity

(ROE), Return on Assets (ROA), capital to risk-weighted assets ratio (CRAR), net interest margin (NIM), profit per employee, and non-performing assets (NPA) are among the important financial metrics it assesses. The study emphasises the difficulties that banks confront, especially the escalating problem of non-performing assets (NPAs), and stresses the significance of banking reforms in order to enhance the sector's overall performance. This research provides important information about the financial health of banks in the public and private sectors by comparing the performance of these banks.

(Ramdas & Dr.Nitin, 2022) Given the significant contribution the Indian banking industry makes to capital formation, innovation, and the money supply, it is critical to assess and examine bank performance in order to maintain a strong financial system. This study uses the widely used CAMEL Rating System, which examines important factors like capital sufficiency, asset quality, management quality, earnings quality, and liquidity, to analyse the performance of a few Public Sector Banks in India. The Bank of Maharashtra outperformed the other banks in the survey, which was based on a sample of 18 public sector banks during a five-year period from 2015 to 2019. It took first place with a composite average of 14.85, whereas IDFC First Bank Ltd, with a composite average of 20.60, came in last. The CAMEL model is a useful instrument for evaluating banks' performance and financial health, providing information about possible areas for development.

(K.Vijaykumar & Ch.Murthy, 2022) In light of global competitiveness and financial inclusion, the performance of Indian banks has emerged as a crucial subject of attention. Since there are now a lot more people in India with bank accounts than there were before the Pradhan Mantri Jan Dhan Yojna, it is critical to evaluate the banks' financial success. The Capital Adequacy, Asset Quality, Management Efficiency, Earnings, and Liquidity (CAMEL) Model is a useful instrument for assessing financial institutions' performance. This study highlights the significance of these factors in assessing a bank's overall health by analysing the performance of six public and six private sector banks over a five-year period. According to the results, private sector banks—Kotak Mahindra in particular—performed better than public sector banks, with Punjab National Bank having the worst financial performance. Furthermore, the study uses the CAMEL model to

determine ICICI Bank's performance, illustrating the bank's position relative to its rivals. The importance of regularly assessing banks' financial soundness to guarantee their contribution to sustainability and economic progress is highlighted by this study.

(S.Balasubramanian, 2022) Given the proposal for their merger, which was suggested by the Narasimha committee and subsequently reaffirmed by the Indian government in 2019, the study looks at the stability of performance of six state-owned public sector banks in India: Allahabad Bank, United Bank of India, Corporation Bank, Oriental Bank of Commerce, Syndicate Bank, and Andhra Bank, over the years 2008 to 2019. In order to determine the factors affecting the banks' financial capacity, the study assesses key performance measures like deposits, advances, interest revenue, interest expenses, operating expenses, profitability, and non-performing assets (NPAs). The results indicate that Syndicate Bank did well in terms of profitability, whereas Oriental Bank of Commerce was the most reliable across a range of financial metrics. Future research should examine how these mergers affect the attainment of synergistic goals and the overall profitability of public sector banking, according to the paper, which divides the factors influencing financial capabilities into four categories: profit influencers, risk measures, revenue influencers, and efficiency measures.

(K.Loganathan, 2022) The profitability study of a few Indian public sector banks looks into what factors affected their post-global financial crisis financial performance. Utilising balanced panel data from 2016 to 2020, the study analyses the effects of profitability, efficiency, liquidity, and solvency on the banks using the Fulmer Model-H Score. According to the results, the profitability of public sector banks in India is greatly influenced by factors like managing total debt, current liabilities, and cash flow, whereas other aspects had negligible effects. In order to attain sustainable profitability, the report advises public sector banks to concentrate on cost reduction.

(Vijayalakshmi & srinivasan, 2023) A well-known framework for analysing bank performance, the CAMEL technique looks at five important factors: capital adequacy, asset quality, managerial quality, earnings, and liquidity. By tackling issues like capital sufficiency, asset quality, and risk management, this method

helps banks to strengthen their financial position and increase profits. The CAMEL rating system is used by regulatory agencies around the world to evaluate financial institutions, guaranteeing a thorough analysis of their performance and stability. A crucial tool for determining a bank's financial strengths and weaknesses, the CAMEL framework enables banks to make the required adjustments. Using data from ten banks, a study comparing public and private sector banks using CAMEL analysis discovered that Indian banks fared better overall than other public and private banks, demonstrating the usefulness of the CAMEL model in evaluating financial performance.

(K.Suresh & P.Subhendu, 2023) The effectiveness of a few Public Sector Undertaking Banks (PSUB) and Private Sector Banks (PSB) in India is assessed in this study, with particular attention paid to stability, liquidity, and profitability. after there hasn't been much research done on bank performance after COVID, the study emphasises the necessity for more investigation. The study uses a T-test for independent samples with data gathered from secondary sources including annual reports and RBI reports from 2017 to 2021 to compare six PSUBs and six PSBs, chosen based on advances as a percentage of deposits. According to the results, PSBs perform better than PSUBs in important financial parameters such as the Capital Adequacy Ratio (CAR), Non-Performing Assets (NPA) to Net Advances (NA), Return on Assets (ROA), and liquidity measures, even if PSUBs have made progress (Author, Year). According to the study, in order to better evaluate financial performance, future research could use other CAMEL indicators, such as net profit margin and credit-deposit ratio. Policymakers in PSUBs can find performance gaps and improve their services by implementing corrective actions with the help of this research's insightful findings.

(B.Afreen & Razaullah.K, 2023) India's banking industry is vital to the country's economic growth, and both Public Sector Banks (PSBs) and Cooperative Banks have a major impact on the advancement of rural areas. This study examines 24 scholarly articles from reputable journals that were published between 2012 and 2023 in order to assess the financial performance of these banks. The financial health of banks has been evaluated using a number of measures, such as the CAMEL model, Data Envelopment Analysis (DEA), and ratio analysis. According

to the review, different studies use different financial performance metrics or particular analysis methods, such as DEA and CAMEL, to rank and assess banks. The research also recommends that a comparative study of PSBs and Scheduled Urban Cooperative Banks be conducted in order to help policymakers make well-informed judgements about possible bank mergers and consolidations. Particularly in light of rural economic development, this study offers insightful information on the current debate over enhancing the stability and efficiency of the Indian banking industry.

(R.Priyajit & Anuradha.P, 2023) Since financial institutions provide timely financial services and are essential to maintaining financial stability, their performance is critical to promoting economic development. Both public and private sector banks in India play a major role in the financial development of the nation, encouraging healthy competition that propels progress. The CAMEL model, which measures important financial variables like capital adequacy, asset quality, management effectiveness, earnings, and liquidity, is used in this study to analyse the financial performance of the leading public and private sector banks in India. The findings show that there is fierce competition in the banking industry as private sector banks outperform their public sector competitors. The study highlights the significance of financial soundness for inclusive growth and suggests that additional sector strengthening can enhance consumer satisfaction and support economic sustainability.

(S.Ishan & J.Bidhyarthi, 2023) Profitability, liquidity, efficiency, and solvency are just a few of the financial metrics used in this study to examine the financial performance of ten Indian public and ten private sector banks between 2017 and 2022. According to the data, private sector banks have generally performed better than public sector banks in terms of profitability indicators like net interest margin (NIM) and return on equity (ROE). This is mostly because private sector banks have better asset quality, are more efficient in their operations, and have fewer overhead costs. Conversely, public sector banks have had trouble staying profitable, mostly as a result of lower loan recovery ratios and greater amounts of non-performing assets (NPAs). Public sector banks, on the other hand, have demonstrated superior liquidity ratios, such as the current ratio and cash-to-deposit ratio, which are

indicative of their larger cash reserves that are owned by the government. Conversely, private sector banks have shown improved asset utilisation for revenue generation, as seen by increased efficiency ratios like the advances to deposits ratio.

(Dr.Maheshkumar, 2023) In spite of the rapid growth of the cooperative banking sector in India, assessing the financial performance of these banks is still difficult because of the many obstacles they face. This study examines the financial performance of two major Karnataka cooperative banks, Bidar District Cooperative Central Bank and Raichur District Cooperative Central Bank, from 2014–15 to 2018–19. The study uses the CAMEL model, which evaluates Capital Adequacy, Asset Quality, Management Efficiency, Earning Capacity, and Liquidity, to assess the banks' capacity to deal with the inefficiencies and challenges that the cooperative banking sector faces. The analysis gives insights into the banks' strengths and weaknesses in managing their financial operations and identifies areas for improvement in their overall performance.

(Elizabeth, Joy, & Bhaumik, 2024) This study uses the CAMEL model to compare the performance of public and private sector banks in order to objectively analyse the controversy surrounding the privatisation of public sector banks in India. The research, which spans the years 2016–17 to 2021–22, comes to the conclusion that privatisation is not a viable long-term way to raise the performance of India's public sector banks. In contrast to commercial banks, public sector banks in India are expected to meet both profit-making and social aims, which has an impact on how they conduct business. The report also emphasises the public sector banks' resilience in handling the COVID-19 pandemic's issues. Therefore, as the public sector is crucial in meeting social demands, the early privatisation of these banks can have more detrimental effects than expected.

(S.Jigyasha & Arvind, 2024) Using data from 2007–08 to 2021–2022, this study examines the credit risk management procedures and financial performance of six Indian commercial banks, three of which are public and three of which are private. To investigate the link between the CAMEL components—capital sufficiency, asset quality, managerial efficiency, earnings, and liquidity—and the dependent variable, return on equity (ROE), the study uses a typical multiple regression model. The results show that during the study period, Punjab National Bank came in lowest in

terms of overall financial performance, followed by Axis Bank and HDFC Bank. The analysis highlights the significance of capital sufficiency, asset quality, and earnings in determining the financial success of banks by showing that these criteria have a major impact on the banks' performance.

(K.Patel & K.Prateek, 2024) By contrasting a few Indian public and private sector banks, the study examines how the capital adequacy ratio affects operating performance, profitability, and return ratios. The study used descriptive analysis, independent sample t-tests, and simple regression to evaluate panel data from twelve Indian banks over a ten-year period (2014–2023), including six public and six private sector banks. The results showed that when it comes to lending practices, asset quality, efficiency, and financial performance, private sector banks perform better than public sector banks. This suggests that in order for public sector banks to compete with private sector banks, they must implement more effective procedures and strengthen their financial position.

(Aswath.R & Sachindra.G, 2025) This study investigates the financial health of selected Public Sector Banks (PSBs) in India, concentrating on two crucial dimensions: capital sufficiency and asset quality. When assessing a bank's ability to withstand financial strain, capital adequacy—as determined by Basel III standards, the Debt to Equity Ratio (DER), and the Leverage Ratio (LR)—is crucial. A bank's ability to manage risk and the health of its loan portfolio are reflected in asset quality, which is measured by indicators like Gross Non-Performing Assets (Gross NPA), Net NPA, and Total Investments to Total Assets (TITA). The report analyses the financial performance of five selected PSBs from 2019 to 2024, indicating a good trend in both capital sufficiency and asset quality. The results demonstrate a noteworthy decrease in non-performing assets (NPAs), which reflects improved loan recovery and provisioning techniques, and notable improvements in key ratios, which are in accordance with Basel III standards. These findings paint a more complete picture of the banks' overall financial soundness by demonstrating their effective response to regulatory requirements and improved resilience to financial shocks.

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CHAPTER :- 4

RESEARCH METHODOLOGY

INDEX

4.1 INTRODUCTION :-

An essential framework for comprehending the methods used to assess the financial performance of a few public sector banks in India using the CAMEL model is provided by the research methodology chapter. In order to investigate the financial health of these institutions, this chapter describes the research strategy, data collection procedures, and analytical approaches used. It seeks to provide a thorough understanding of how financial performance metrics are assessed and monitored within the framework of public sector banks in India.

4.2 Meaning and Definition of Research :-

Finding, analysing, and improving facts, hypotheses, and applications in a certain field of study is the goal of research, which is a methodical process of inquiry and examination. It entails obtaining information, evaluating it, and coming to conclusions in order to address certain issues or provide answers to questions. Whether in the social sciences, humanities, or sciences, research aims to increase knowledge and comprehension in a variety of fields.

Basic and applied research are the two main categories into which research may be divided. While applied research seeks to address particular, real-world issues, basic research concentrates on advancing theories and knowledge without any direct practical application.

4.3 What is Research Methodology :-

The systematic process of conducting a study that outlines the techniques, steps, and resources for gathering, evaluating, and interpreting data is known as research methodology. It comprises essential elements including study design, sample tactics, data collection methods, data analysis plans, and the instruments used in these procedures. By leading the researcher through a methodical and moral process, the methodology guarantees that the study is rigorous, valid, and trustworthy. Determining the "how" of the research reduces prejudice and facilitates well-informed decision-making, which eventually aids in achieving the goals of the study.

4.4 Research Process :-

The research process is a methodical set of actions that researchers do in order to answer a particular research issue or problem. First, the research problem is identified, in which the researcher identifies the problem or knowledge gap and establishes the study's focus. In your dissertation, for example, the research topic is to use the CAMEL model to assess the financial performance of a few Indian public sector banks.

A comprehensive literature review is then carried out to look at previous research and theories on the subject. This aids in the formulation of pertinent research questions or hypotheses, the identification of knowledge gaps, and an understanding of the existing state of knowledge. For instance, the study may make the hypothesis that there are differences in performance amongst banks and that the CAMEL model has a significant relationship with the financial performance of public sector banks in India.

The next step is the research design phase, during which the investigator describes the methodology for the investigation. This entails choosing the sample strategy, data gathering methods, and study style (qualitative, quantitative, or mixed approaches). The financial performance of the banks could be assessed in your study using primary data from interviews with financial experts and secondary data from financial reports.

The researcher gathers the required data after deciding on a research strategy. Both primary and secondary data must be gathered at this stage; the latter may include databases such as CMIE Prowess, yearly reports, and financial statements. In order to evaluate the banks' capital adequacy, asset quality, management quality, earnings, and liquidity, the data is subsequently subjected to statistical or analytical techniques, such as the computation of financial ratios and the application of the CAMEL model.

The interpretation of the results, which discusses the findings in light of the research topic and hypotheses, marks the final stage of the study. In addition to policy recommendations, recommendations are made for enhancing financial performance. The study's shortcomings are discussed, and potential directions for

further investigation are noted, like examining the performance of banks in the private sector or contrasting the CAMEL model with alternative frameworks for financial evaluation. This methodical approach guarantees a thorough and significant contribution to the topic of study.

4.5 Title of Study :-

"Evaluating Financial Performance of Selected Public Sector Banks in India : A Study Based on the CAMEL Model"

4.6 Objective of the Study :-

- To use the CAMEL model to assess the financial performance of selected Indian public sector banks.
- To examine the patterns in the chosen banks' financial performance over a given time frame.
- To evaluate the CAMEL model's suitability and efficacy in assessing the financial performance of India's public sector banks.

4.7 Hypothesis of the Study :-

Null Hypothesis (H_0) :- The CAMEL model components (Capital Adequacy, Asset Quality, Management Quality, Earnings, and Liquidity) do not collectively have a significant difference on the financial performance of selected public sector banks in India.

Alternative Hypothesis (H_1) :- The CAMEL model components (Capital Adequacy, Asset Quality, Management Quality, Earnings, and Liquidity) collectively have a significant difference on the financial performance of selected public sector banks in India.

4.8 Time Period of Study :-

" The period of study for this research is from 2020 to 2024 covering a span of five years."

4.9 Sample Selection :-

The market capitalisation of banks was used to choose the sample for this study, with an emphasis on the top 5 Public Sector Banks in the India in terms of market capitalisation. This choice was chosen to guarantee that the study concentrates on the most important and powerful figures in the banking sector.

Name of the Public Sector Bank	Market Capitalisation (Rs. Cr) (As on 03rd March, 2025)
1. State Bank of India	620,394.96
2. Bank of Baroda	101,229.41
3. Punjab National Bank	100,298.92
4. Union Bank	83,206.30
5. Indian Overseas Bank	78,879.77

Table 4.1 Top 5 Indian Public Sector Banks

(Source :- https://www.moneycontrol.com/stocks/marketinfo/marketcap/bse/bank-public.html)

4.10 Data Collection Method :-

Secondary data from sources including annual reports, regulatory filings (SEBI), financial databases (e.g., Bloomberg, Money control), and RBI publications would be the main source of the data gathering. Major Indian public sector banks that were picked based on factors like market capitalisation and total assets will make up the sample. Balance sheets, income statements, and cash flow statements will be used to collect important financial information for each bank, such as ratios and metrics for the CAMEL model's components of capital adequacy, asset quality, management quality, earnings, and liquidity. Trend, comparison, and ratio analyses will be performed on the data after it has been arranged in an Excel spreadsheet or database. Accuracy and availability of data are potential drawbacks, especially when it comes to qualitative factors like managerial quality.

4.11 Evaluating the financial performance of banks is essential for several reasons :

Understanding the general health of public sector banks in India requires research on assessing their financial performance using the CAMEL model. By evaluating

capital sufficiency, asset quality, management quality, earnings, and liquidity, the CAMEL model provides a thorough framework for assessing financial stability. Because public sector banks are so important to the Indian economy, lending rates, public confidence, and economic stability are all directly impacted by their performance.

In India, public sector banks' performance is crucial to the formulation of public policy. These banks are essential to the flow of credit in important industries like infrastructure, small businesses, and agriculture. Policymakers can create plans to fortify these institutions by comprehending their financial performance, which is crucial for promoting stability and long-term economic progress.

By highlighting inefficiencies and weak points in public sector banks, the CAMEL model also helps with risk management. Researchers can identify flaws in the banking system and recommend fixes by examining these areas, which lowers the likelihood of financial crises and safeguards the economy.

It's critical to assess the performance of public sector banks in light of the growing competition from private sector banks. Comparing various banks is made possible by the CAMEL model, which offers insightful information on best practices, potential areas for development, and competitive advantages that can help these banks maintain their competitiveness in a market that is changing.

In India, public sector banks play a significant role in promoting financial inclusion, particularly in underserved and rural areas. A CAMEL model-based study can assess how well their financial inclusion initiatives are working and identify areas that require further work to provide banking services to underserved populations.

Discussions about banking reforms and privatisation also benefit from research on these banks' financial performance. Gaining knowledge about the financial performance and resource management of public sector banks can help one better understand the possible advantages and difficulties of privatisation or other reforms meant to increase the banking industry's efficiency.

Lastly, the CAMEL model may be used to examine the financial performance of public sector banks over time, revealing historical patterns like the way banks have handled problems like non-performing assets (NPAs) and recessions. The general

stability and expansion of these banks, which are essential to India's financial system, are enhanced by this historical perspective, which also helps predict future patterns and guides remedial measures.

4.12 Limitations of the Study :-

There are a number of restrictions to take into account while utilising the CAMEL model to assess the financial performance of certain public sector banks in India. Since public sector banks might not regularly release thorough data for all CAMEL characteristics, especially with relation to non-performing assets (NPAs), data availability and reliability are crucial considerations. Furthermore, the CAMEL model itself might not fully account for all facets of a bank's performance, such as management quality or external factors like macroeconomic conditions and regulatory changes, and the study might only cover a small time period, which might not capture long-term trends in financial health. Furthermore, the findings' comprehensiveness may be impacted if non-financial elements like political influences or technical improvements are excluded.

Since the study focusses exclusively on public sector banks in India, which might not be indicative of the larger banking industry, additional limitations result from the sample and geographic restrictions. It may be challenging to separate the effects of market forces, governmental regulations, and worldwide financial crises from the performance of banks using the CAMEL framework. The depth of research may also be limited by time and resource constraints; the study may concentrate on a small sample of banks or a brief period of time, which would limit how broadly the results can be applied. It is important to recognise these elements in order to clearly define the parameters and extent of the study.

4.13 Problem of the Study :-

Understanding the financial performance of a few public sector banks in India, especially in light of significant obstacles including diminishing profitability, an increase in non-performing assets (NPAs), and problems with capital adequacy and risk management, is the main focus of your research. Even with government assistance and regulatory changes, many banks still struggle to manage profitability, liquidity, and asset quality, which has an impact on their overall financial health.

The CAMEL model will offer a methodical and uniform framework for evaluating the banks' performance on metrics such capital sufficiency, asset quality, management effectiveness, profits, and liquidity. This is how the study intends to examine these concerns.

The study will also examine how government policies and regulatory changes affect public sector banks' financial performance, with an emphasis on how well they handle these issues. Additionally, the analysis seeks to pinpoint governance problems and managerial inefficiencies that may directly impact financial results. The study compares the performance of a few public sector banks in an effort to identify the variables influencing performance variances. The results provide important information that can direct management plans and policy changes aimed at enhancing the stability and profitability of these institutions.

4.14 Future Scope of the Study :-

There are a number of possible directions for future research in the area of CAMEL model-based financial performance evaluation of public sector banks in India. Expanding the study to include international and private sector banks doing business in India could be a crucial step in enabling a comparison of the performance of various bank types. This would offer a more comprehensive view of the state of the Indian banking industry as a whole. Longitudinal studies that cover 15 to 20 years may also highlight long-term patterns, the effects of past banking reforms, and the ways in which outside variables like COVID-19 or economic crises affect bank performance.

Future studies could also examine how digital transformation and technology developments affect banks' financial performance. It is crucial to investigate how the emergence of fintech, AI, and digital banking may affect essential CAMEL criteria. In a banking environment that is changing quickly, incorporating additional financial models or sophisticated analytical methods like data envelope analysis or machine learning algorithms may provide a more thorough knowledge of financial health. The impact of macroeconomic variables such as GDP growth, inflation, and interest rates on the operations of public sector banks could also be investigated.

Additional research might concentrate on assessing how regulatory measures, like recapitalisation programs and the Insolvency and Bankruptcy Code (IBC), affect banks' financial well-being. Further examination is also necessary of corporate governance and management quality, including leadership, risk management, and decision-making procedures. Furthermore, environmental risk issues and sustainability are becoming more and more significant for public sector banks, especially when considering ESG (Environmental, Social, and Governance) factors. Future studies that go deeper into these topics may yield insightful information that improves management tactics, policy choices, and our general comprehension of the dynamics of the Indian banking industry.

4.15 Research Gap :-

There may not be much study explicitly looking at public sector banks in connection to market capitalisation, even though many studies concentrate on private banks or the banking industry as a whole.

Since high-market-capitalization public sector banks may have operational and financial characteristics that are very different from those of smaller public sector or private banks, research might concentrate on bridging this gap by applying the CAMEL model specifically to these institutions.

The CAMEL model is applied to private banks or developed markets in a large number of current studies. However, there might not be enough studies that use this paradigm for public sector banks in well capitalised emerging markets.

4.16 Chapter Plan :-

Chapter 1 :- Introduction • Introduction to the Banking Industry • Meaning, Definition, Function, History, Structure of Bank • Indian Public Sector Bank : An Overview • Banking Legislation, Performance Significance, Banking Performance Evaluation Overview
Chapter 2 :- Conceptual Framework

• What is Framework in Research • CAMEL Model Overview, Structure and Key Ratios • Sample Profile of the Study, Selection Criteria
Chapter 3 :- Literature Review • Reviews of Related Research
Chapter 4 :- Research Methodology • Introduction, Meaning, Definition of Research • Explanation of Research Methodology, Research Process • Title, Objective, Hypothesis, Time Period, Limitations, Problems, Future Scope of the Study
Chapter 5 :- • Data collection, Data Analysis, Data Interpretation • Single Factor ANOVA test
Chapter 6 :- • Summary, Findings, Suggestions & Conclusion of the study

Table 4.2 Chapter Plan (Self-Constructed**)**

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- https://www.scribbr.com/category/methodology/
- https://southcampus.uok.edu.in/Files/Link/DownloadLink/RM%20U1%20P1.pdf

CHAPTER :- 5

DATA ANALYSIS & DATA INTERPRETATION

INDEX

5.1 INTRODUCTION :-

Every research endeavour must include data collecting since it is the foundation for gathering the information required to address research questions, test hypotheses, or investigate novel occurrences. To guarantee the authenticity, precision, and dependability of the study findings in this dissertation, data gathering will be an essential stage. In order to fulfil the research objectives and provide a thorough understanding of the issue under investigation, the approach will entail methodically collecting both quantitative and/or qualitative data.

The precise objectives of this study and the type of research questions will direct the methodology for gathering data. The present study will employ a variety of [specify methodologies, such as surveys, interviews, observations, etc.] to guarantee a comprehensive viewpoint and to offer both statistical and detailed insights. Based on their compatibility with the study design and the kind of data needed to achieve the objectives of the dissertation, these techniques were chosen.

To maintain the integrity of the study process, data will be gathered in an ethical and systematic manner while adhering to stringent participant permission, privacy, and confidentiality criteria. The requirement for accuracy, consistency, and applicability to the research setting will also guide the data collection procedure. This chapter will provide an overview of the data gathering approach, including the tools utilised, the sample techniques, and the steps taken during the investigation.

5.2 What is Data Collection ?

A key step in any research project is data collection, which is methodically obtaining and evaluating information in order to investigate phenomena, test theories, or find answers to research questions. It guarantees that correct and trustworthy data form the foundation of the research findings. The two main categories of data collection are qualitative, which uses non-numerical data to investigate experiences, beliefs, and behaviours through techniques like case studies and interviews, and quantitative, which uses numerical data statistically analysed through methods like surveys and experiments.

Identifying the study problem to ascertain the sort of data required, choosing suitable techniques and instruments for data collection, selecting participants or

sources, getting the data, organising and storing it for analysis, and so on are the main processes in the data collection process. Researchers can guarantee the validity, reliability, and relevance of their data by adhering to an organised and moral method to data gathering, which will ultimately result in reliable and perceptive research findings.

5.3 What is Data Analysis ?

Examining, purifying, and converting data in order to glean useful information, make inferences, and aid in decision-making is known as data analysis. In order to respond to research questions, test hypotheses, or resolve issues, it entails finding patterns, trends, and links within data sets. Finding significant discoveries that can direct future research or help with decision-making is the aim.

The two primary categories of data analysis are qualitative and quantitative. Statistical methods including regression analysis, inferential statistics, and descriptive statistics are used in quantitative analysis to work with numerical data. In contrast, qualitative analysis works with non-numerical data and uses techniques such as content analysis, theme analysis, and grounded theory to examine patterns and insights in observations, interviews, and text. In order to reach research goals and draw well-informed findings, both strategies are necessary.

5.4 What is Data Interpretation ?

The process of making meaning of the information gathered and examined for a research project is known as data interpretation. It entails looking at the results, interpreting what they imply, and making inferences from them. Interpreting data involves more than just displaying the numbers or patterns found; it also entails having a thorough knowledge of the significance of the findings in relation to the goals, questions, and ideas already in existence.

Explaining the meaning of the data, identifying correlations between variables, and offering insights that can guide choices or address research issues are the objectives of data interpretation. It also entails assessing the findings' relevance, taking into account the study's limitations, and deciding if the findings confirm or refute the initial theories or predictions of the research.

Data interpretation aids in the clear narrative or explanation of study findings in both quantitative and qualitative studies, which can direct future studies, influence policy choices, or support real-world applications.

5.5 List of Top 5 Public Sector Banks Selected for the Analysis Purpose

SR. NO	NAME OF THE PUBLIC SECTOR BANK
1.	State Bank of India (SBI)
2.	Bank of Baroda (BOB)
3.	Punjab National Bank (PNB)
4.	Union Bank of India
5.	Indian Overseas Bank (IOB)

Table 5.1 List of Selected Public Sector Banks (Self-Constructed)

5.6 Capital Adequacy (C) :-

The word "capital adequacy" describes a bank's financial soundness, particularly its capacity to sustain operations and absorb losses while remaining solvent. Banks must meet minimum capital standards set by regulators to make sure they can survive financial strains like recessions or large losses without endangering their depositors or the larger financial system.

5.7 Capital Adequacy Ratio (CAR) :-

When evaluating a bank's financial health and making sure it has adequate capital to manage risk, the Capital Adequacy Ratio is critical. In order to preserve the stability and integrity of the banking system worldwide, regulators employ it.

(In Percent)

BANKS	2020	2021	2022	2023	2024	MIN	MAX	AVG	RANK
SBI	13.06	13.74	13.83	14.68	14.28	13.06	14.68	13.92	5
BOB	13.6	13.87	15.44	15.15	16.37	13.6	16.37	14.89	1
PNB	14.14	14.32	14.5	15.5	15.96	14.14	15.96	14.88	2

UBI	12.81	13.85	14.52	16.04	16.97	12.81	16.97	14.84	3
IOB	10.72	15.3	13.83	16.1	17	10.72	17	14.59	4

Table 5.2 Capital Adequacy Ratio of Selected Public Sector Banks (Source : Secondary Data Collected From Respective Banks)

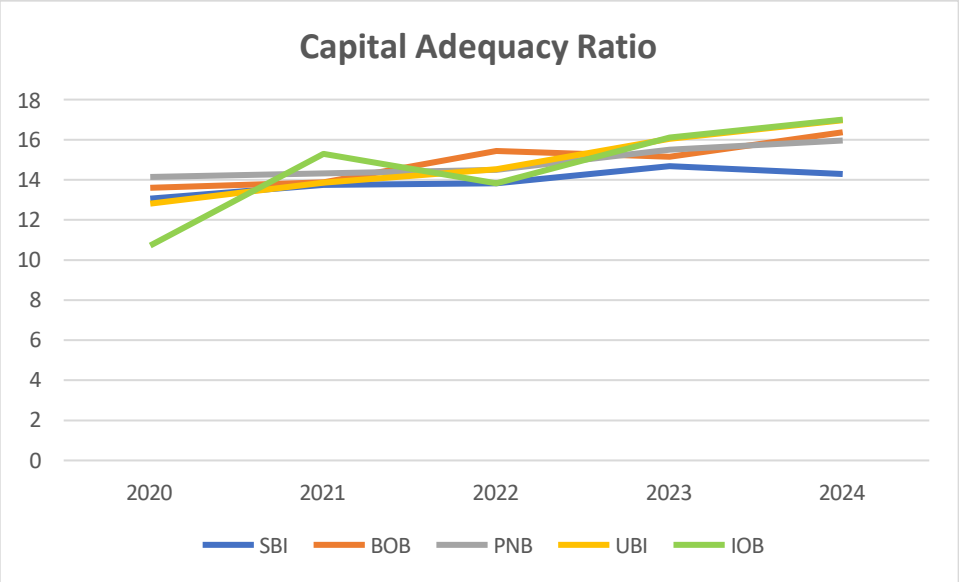

Chart 5.1 Capital Adequacy Ratio of Selected Public Sector Banks

Interpretation :- Five significant Indian Public Sector Banks' capital adequacy ratios (CAR) from 2020 to 2024 are shown in the table, along with the lowest, maximum, and average CAR values as well as rankings based on average CAR. Because of their comparatively solid capital levels, Bank of Baroda (BOB) had the highest average CAR (14.89), followed closely by Punjab National Bank (PNB) (14.88) and Union Bank of India (UBI) (14.84). The bank that exhibited the most volatility was Indian Overseas Bank (IOB), which had a sharp rise from 10.72 in 2020 to 17. Even though State Bank of India (SBI) is a top public sector bank, it came last and had the lowest average CAR (13.92). The data points to a general upward trend in capital adequacy for all banks, with a notable uptick in subsequent years, perhaps as a result of internal capital strengthening initiatives and regulatory requirements. These banks' competitive advantage is highlighted by the rankings, and BOB continues to retain the highest level of capital adequacy, which could boost investor confidence and financial stability.

5.8 Total Advances to Assets Ratio :-

One important financial indicator is the ratio of total advances to assets, which shows what percentage of a bank's total assets are distributed as advances or loans. This ratio represents Public Sector Banks' (PSBs') risk management and lending efficiency. bigger asset allocation to investments or reserves is indicative of a more conservative strategy, whereas a higher ratio shows that a bigger percentage of the bank's assets are used in loans that generate income. PSBs are essential to India's economic growth since they lend to important industries like small companies, infrastructure, and agriculture. With more assets linked to possibly non-performing loans (NPAs), a very high advances-to-assets ratio, however, may raise risk exposure. Alternatively, a smaller ratio could be a sign of underutilisation of funds, which would result in lesser profitability. Regulatory constraints, risk appetite, and economic conditions are some of the variables that affect the optimal ratio. According to RBI standards, PSBs must ensure financial stability by striking a balance between asset quality and loan growth. Rising non-performing assets (NPAs), government recapitalisation initiatives, and economic slowdowns have all caused variations in this ratio for Indian PSBs over time. As a result, keeping an eye on the Total Advances to Assets Ratio aids in evaluating the general well-being and operational effectiveness of PSBs, assisting regulators, investors, and policymakers.

(In Percent)

BANKS	2020	2021	2022	2023	2024	MIN	MAX	AVG	RANK
SBI	58.8	54	54.9	57.9	59.9	54	59.9	57.10	3
BOB	58.5	60.13	59.49	63.15	65.8	58.5	65.8	61.41	1
PNB	56	53.08	54.78	56.06	58.91	53.08	58.91	55.77	4
UBI	57.19	54.82	55.57	59.32	62.34	54.82	62.34	57.85	2
IOB	46.53	46.61	48.13	56.8	60.62	46.53	60.62	51.74	5

Table 5.3 Total Advances to Assets Ratio of Selected Public Sector Banks (Source : Secondary Data Collected From Respective Banks)

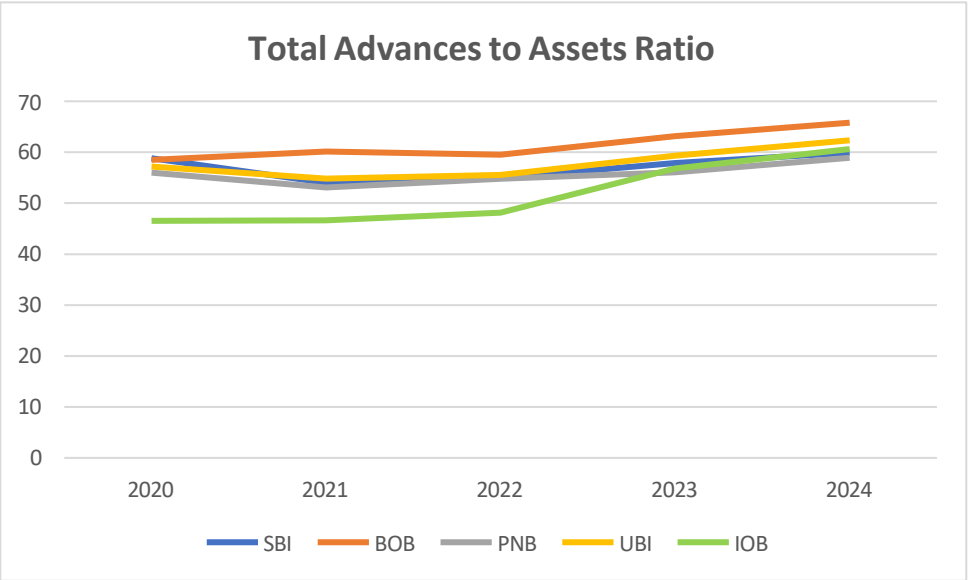

Chart 5.2 Total Advances to Assets Ratio of Selected Public Sector Banks

Interpretation :- The Total Advances to Assets Ratio for the top five Public Sector Banks (PSBs) in India between 2020 and 2024 is displayed in the table. Under the CAMEL model, which is frequently used to evaluate the stability and financial performance of banks, this ratio is essential to evaluating the Asset Quality and Earnings. A greater ratio indicates that advances account for a sizable amount of a bank's assets, which could improve income creation but also raise credit risk. In terms of aggressive lending and improved asset utilisation, Bank of Baroda (BOB) has the highest average ratio of any bank, at 61.41%, with a peak of 65.8% in 2024. This metric places it at the top of the list of banks. A balanced approach to lending while managing risk is demonstrated by Union Bank of India (UBI), which comes in second with an average of 57.85%. With an average of 57.10%, State Bank of India (SBI), the biggest PSB, has consistently provided loans over the years. The lower average ratios of 55.77% and 51.74%, respectively, of Indian Overseas Bank (IOB) and Punjab National Bank (PNB) suggest more conservative lending. In example, IOB had the lowest ratio in 2020 (46.53%), indicating a cautious approach. However, by 2024, it had risen dramatically to 60.62%, indicating a rise in lending activity. First and second-place finishers BOB and UBI exhibit superior asset utilisation, while SBI keeps a stable balance. To stop asset deterioration, PNB and IOB must maintain credit quality notwithstanding advancements. All things considered, this research helps stakeholders assess these PSBs' risk exposure and financial health by offering insights into how effectively they manage their assets.

5.9 Assets Quality (A) :-

The term "asset quality" describes the state of Public Sector Banks' (PSBs') loan portfolios, including the proportion of recoverable loans and non-performing assets (NPAs). Profitability and capital sufficiency are impacted by higher NPAs, which indicate poor asset quality. PSB asset quality is intended to be improved by the Reserve Bank of India (RBI) and government programs such as asset reconstruction and recapitalisation. The reduction of bad loans is aided by reforms like digital monitoring, insolvency resolution, and stronger lending standards. Investor confidence, economic growth, and financial stability all depend on maintaining high asset quality.

5.10 Net NPA Ratio (Non-Performing Assets) :-

Public Sector Banks' (PSBs') Net NPA (Non-Performing Assets) ratio shows the proportion of problematic loans after subtracting provisions from total advances. Better financial health and asset quality are indicated by a lower Net NPA ratio. NPAs have decreased as a result of government and RBI initiatives such as recoveries, write-offs, and resolutions. To keep the Net NPA ratio low, regular monitoring and robust credit appraisal procedures are necessary.

(In Percent)

BANKS	2020	2021	2022	2023	2024	MIN	MAX	AVG	RANK
SBI	2.23	1.5	1.02	0.67	0.57	0.57	2.23	1.20	5
BOB	3.13	3.09	1.61	1.1	0.59	0.59	3.13	1.90	4
PNB	5.78	5.73	4.8	2.72	0.73	0.73	5.78	3.95	1
UBI	5.49	4.62	1.56	1.08	0.81	0.81	5.49	2.71	2
IOB	5.44	3.58	2.65	0.62	0.42	0.42	5.44	2.54	3

Table 5.4 Net NPA (Non-Performing Assets) Ratio of Selected Public Sector Banks
(Source : Secondary Data Collected From Respective Banks)

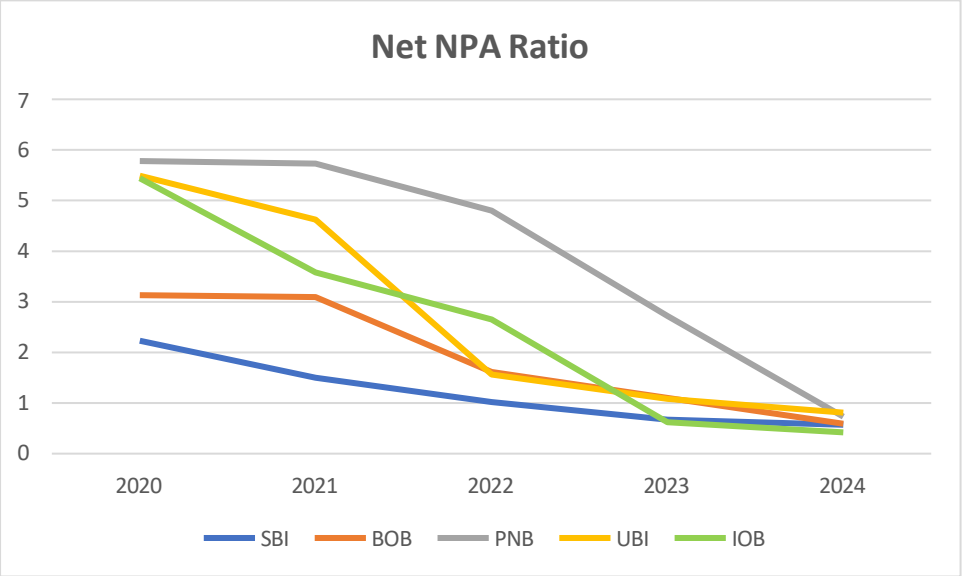

Chart 5.3 Net NPA (Non-Performing Assets) Ratio of Selected Public Sector Banks

Interpretation :- From 2020 to 2024, the table shows the Net Non-Performing Assets (Net NPA) of the largest Public Sector Banks (PSBs), along with the minimum, maximum, and average Net NPA values. The rank of the PSBs is determined by the average NPA percentage. Net NPA has been steadily declining for all banks, which is indicative of stronger recovery procedures, greater asset quality, and stricter regulations. Punjab National Bank (PNB) ranked 1 with the highest average Net NPA (3.95%), suggesting ongoing asset quality concern in spite of improvements. With average Net NPAs of 2.71% and 2.54%, respectively, Union Bank of India (UBI) and Indian Overseas Bank (IOB) came next, indicating that their historically large NPAs are being steadily reduced. With comparatively lower average non-performing assets (NPAs) of 1.90% and 1.20%, respectively, Bank of Baroda (BOB) and State Bank of India (SBI) demonstrated improved risk management and a stronger financial position. Effective resolutions through bankruptcy procedures, loan write-offs, and economic recovery are highlighted by the notable decline in non-performing assets (NPAs) during a five-year period, especially in IOB (5.44% to 0.42%), PNB (5.78% to 0.73%), and UBI (5.49% to 0.81%). With the majority of banks cutting their bad loans to less than 1%, the minimal NPAs in 2024 show notable progress. SBI's comparatively low Net NPA (0.57% in 2024) is indicative of its effective recovery procedures and robust credit standards. Asset quality has significantly improved as a result of government programs like recapitalisation, the Insolvency and Bankruptcy Code (IBC), and aggressive NPA resolution techniques.

5.11 Provision Coverage Ratio (PCR) :-

The percentage of problematic loans covered by provisions set aside for possible losses is shown by the Provision Coverage Ratio (PCR) for Public Sector Banks (PSBs). A greater PCR lowers the risk to the bank's balance sheet by reflecting a better financial cushion against non-performing assets (NPAs). A PCR above 70% is regarded as healthy by regulators and analysts, guaranteeing that banks are better equipped to handle credit risks.

(In Percent)

BANKS	2020	2021	2022	2023	2024	MIN	MAX	AVG	RANK
SBI	83.62	87.75	90.2	91.91	91.89	83.62	91.91	89.07	2
BOB	85.46	86.46	86.96	93.16	93.3	85.46	93.3	89.07	3
PNB	85.52	87.2	91.1	91.91	96.67	85.52	96.67	90.48	1
UBI	67	78.21	83.61	90.34	92.69	67	92.69	82.37	5
IOB	76.79	82.09	91.34	96.85	97.06	76.79	97.06	88.83	4

Table 5.5 Provision Coverage Ratio (PCR) of Selected Public Sector Banks (Source : Secondary Data Collected From Respective Banks)

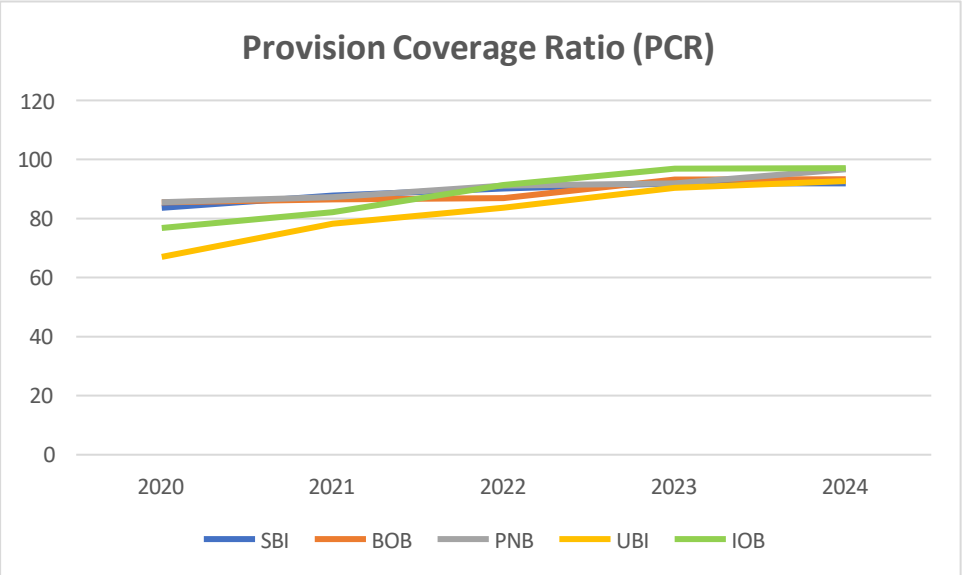

Chart 5.4 Provision Coverage Ratio (PCR) of Selected Public Sector Banks

Interpretation :- The Provision Coverage Ratio (PCR) of five Public Sector Banks (PSBs) from 2020 to 2024 is shown in the table, along with the PCR's minimum, maximum, average, and performance-based ranking. A bank's PCR, which shows the percentage of money set aside to cover possible losses from bad loans, is a crucial sign of its financial soundness. With the highest average PCR of 90.48 and a peak of 96.67% in 2024, Punjab National Bank (PNB) is in first place. Bank of Baroda (BOB) and State Bank of India (SBI) both have average PCRs of 89.07, but BOB's peak PCR is the highest at 93.3%, marginally higher than SBI's 91.91%. With an average PCR of 88.83%, Indian Overseas Bank (IOB) comes in second, reaching the highest individual PCR of 97.06% in 2024. Despite notable progress over the years, Union Bank of India (UBI) has the lowest average PCR at 82.37%, rising from 67% in 2020 to 92.69% in 2024. A consistent rise in PCR across all banks is indicative of improved provisioning against bad loans and increased financial resilience. SBI and BOB continued to compete, but PNB's steady progress guaranteed its top spot. IOB's asset quality has significantly improved, as seen by its dramatic increase from 76.79% in 2020 to 97.06% in 2024. The banks with the lowest and highest values indicate better financial discipline, especially in later years. The decreasing difference between PCR's lowest and highest values among banks suggests consistent advancements in risk management. Despite being the biggest bank in India, SBI's provisioning strength was somewhat better than PNB's. All banks' high PCR in 2023 and 2024 indicates better asset quality, maybe as a result of strict NPA management and regulatory changes. The disparity between PNB (90.48%) and UBI (82.37%), the banks with the lowest and highest rankings, indicates differing degrees of risk management practices. The sharp increase in PCR for UBI suggests a more aggressive provisioning strategy in subsequent years. A proactive approach to reducing credit risks is indicated by the rising trend in PCR across all banks. The rankings show how well each bank provisions against bad debts, which has a direct effect on financial stability and investor trust. Stronger financial buffers are displayed by the banks with the greatest peaks, like IOB and PNB, which lowers the possible risks related to non-performing assets (NPAs). By 2024, the comparatively high PCR for all banks points to increased risk coverage and capital sufficiency, which will better prepare them to manage upcoming financial difficulties. Overall, the data shows that PSBs' provisioning policies have been on the rise, pointing to a strong banking system that is more resilient to bad loans.

5.12 Management Quality (M) :-

The CAMEL model evaluates management quality, which measures how well a bank leads, governs, and makes strategic decisions. In order to maintain financial stability, Public Sector Banks (PSBs) must assess risk management, operational effectiveness, and regulatory compliance. Long-term stability and growth depend on strong management, which is demonstrated by increased Provision Coverage Ratios (PCR), better asset quality, and consistent profitability.

5.13 Return on Assets (ROA) Ratio :-

By assessing how well a Public Sector Bank (PSB) uses its assets to generate net income, the Return on Assets (ROA) ratio gauges its profitability. A higher ROA represents better financial performance, reflecting strong earnings and effective asset management. Because of higher provisioning requirements and government-mandated lending obligations, PSBs typically have lower ROA than private banks; however, over time, improved asset quality, higher interest income, and better cost management can boost ROA. A steady increase in ROA indicates better financial health, increased efficiency, and better shareholder value for PSBs.

(In Percent)

BANKS	2020	2021	2022	2023	2024	MIN	MAX	AVG	RANK
SBI	0.47	0.46	0.65	0.93	0.99	0.46	0.99	0.70	1
BOB	0.07	0.12	0.58	0.97	1.13	0.07	1.13	0.57	2
PNB	0.05	0.2	0.28	0.22	0.56	0.05	0.56	0.26	4
UBI	-0.52	0.27	0.44	0.65	0.98	-0.52	0.98	0.36	3
IOB	-3.27	0.3	0.57	0.66	0.75	-3.27	0.75	-0.20	5

Table 5.6 Return on Assets Ratio (ROA) of Selected Public Sector Banks (Source : Secondary Data Collected From Respective Banks)

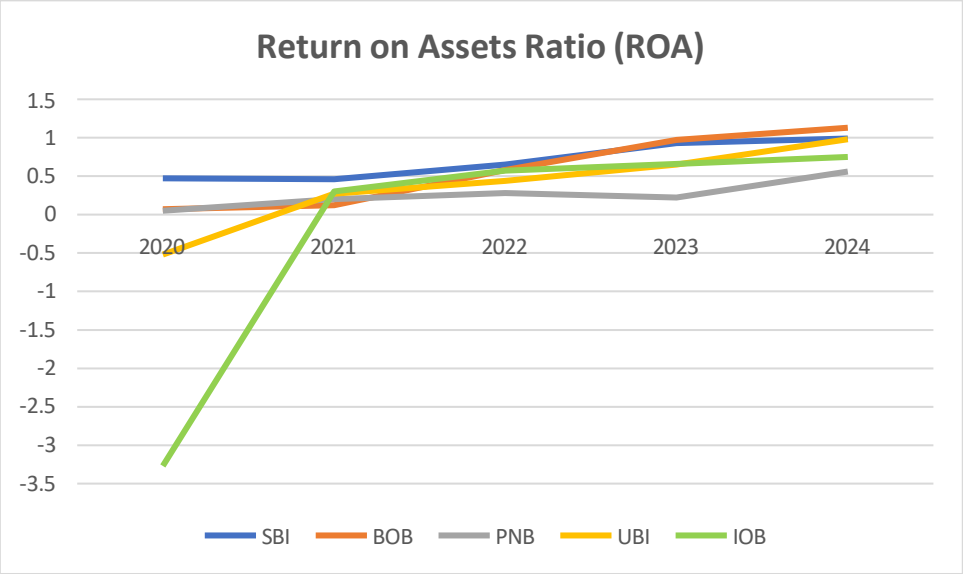

Chart 5.5 Return on Assets Ratio (ROA) of Selected Public Sector Banks

Interpretation :- The table highlights the financial performance and asset-profit-generating efficiency of five significant Public Sector Banks (PSBs) from 2020 to 2024 by displaying their Return on Assets (ROA) ratio. Leading the pack with the greatest average ROA of 0.70, which peaked at 0.99% in 2024, is State Bank of India (SBI), which demonstrates its robust profitability and operational effectiveness. Following closely behind, Bank of Baroda (BOB) has an average ROA of 0.57, which indicates a steady increase in earnings from 0.07% in 2020 to 1.13% in 2024. Even though Punjab National Bank's (PNB) average return on assets (ROA) of 0.26 has improved somewhat, reaching 0.56% in 2024, its total profitability is still lower than that of its peers. Third-placed Union Bank of India (UBI) showed a spectacular turnaround, going from a negative return on assets (ROA) of -0.52% in 2020 to 0.98% in 2024, indicating a robust recovery and improved asset utilisation. Due mainly to a deeply negative ROA of -3.27% in 2020, Indian Overseas Bank (IOB) had the lowest average ROA of -0.20. However, in 2024, they showed improvement by reaching 0.75%. With the majority of banks reaching their greatest ROA in 2024, indicating improved asset quality and profitability, the pattern across banks points to an overall improvement in financial health. While BOB's rapid expansion demonstrates its enhanced financial tactics, SBI's steady performance and top position show its capacity to sustain steady earnings. Despite its progress, PNB continues to trail behind in ROA, indicating that cost control and asset utilisation need to be improved. UBI's notable recovery from a negative ROA demonstrates enhanced profitability and risk control. Although its consistent rise in subsequent years suggests a recovery, IOB's negative average

ROA is a reflection of previous financial difficulties. While the 2024 maximum ROA numbers show increased financial resilience, the banks' minimum ROA values suggest previous financial difficulties, particularly in IOB and UBI. Better credit risk management, increased operational effectiveness, and profitability for all PSBs are indicated by a continuously improving ROA trend. According to the data, increased profitability in recent years has been a result of strategic reforms, greater asset quality, and better provisioning. Notwithstanding advancements, PSBs must continue to concentrate on maintaining greater ROA levels through improved cost control, more interest revenue, and decreased non-performing assets (NPAs). The majority of banks' rising ROA values point to a promising future, making them more competitive and long-term financially healthy.

5.14 Return on Equity Ratio (ROE) :-

The Return on Equity (ROE) ratio indicates financial efficiency and profitability by evaluating a Public Sector Bank's (PSB) capacity to turn a profit in relation to shareholder equity. Whereas a lower ROE can indicate lesser profitability or more capital needs, a higher ROE indicates superior returns for investors and sound capital management. Over time, improved operational performance, improved asset quality, and increased financial stability are all shown by PSBs' steady increases in ROE.

(In Percent)

BANKS	2020	2021	2022	2023	2024	MIN	MAX	AVG	RANK
SBI	8.69	8.89	12.53	16.8	17.31	8.69	17.31	12.84	1
BOB	1.21	1.87	8.54	14.18	15.67	1.21	15.67	8.29	2
PNB	0.74	3	4.26	3.54	8.92	0.74	8.92	4.09	4
UBI	-9.46	4.87	7.94	11.68	14.94	-9.46	14.94	5.99	3
IOB	-52.78	4.9	7.43	8.3	10.52	-52.78	10.52	-4.33	5

Table 5.7 Return on Equity Ratio (ROE) of Public Sector Banks (Source : Secondary Data Collected From Respective Banks)

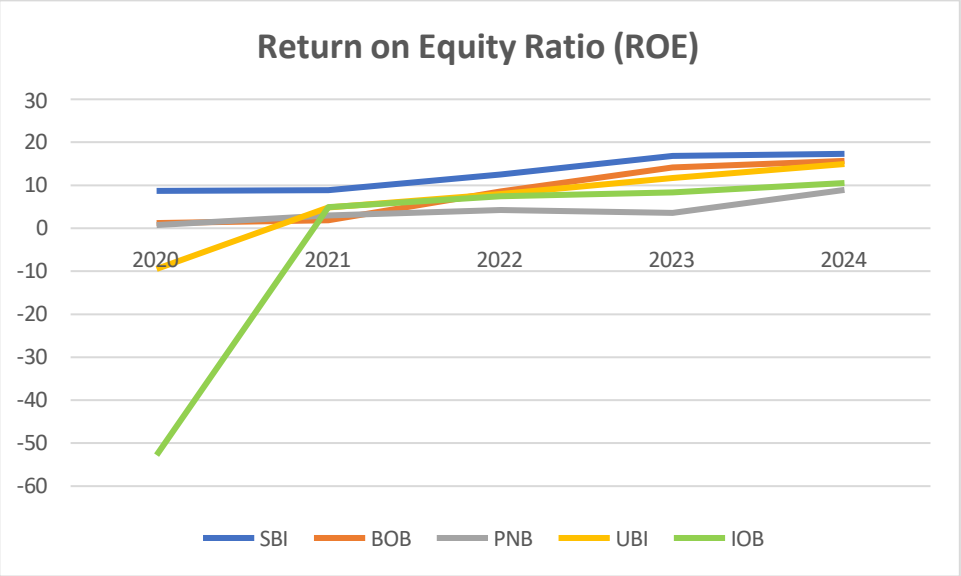

Chart 5.6 Return on Equity Ratio (ROE) of Selected Public Sector Banks

Interpretation :- Five Public Sector Banks (PSBs) are shown in the table with their Return on Equity (ROE) ratios from 2020 to 2024. This ratio shows how profitable and effective these PSBs are at producing returns for their shareholders. Strong earnings and capital utilisation are demonstrated by State Bank of India (SBI), which has the highest average ROE of 12.84 and peaks at 17.31% in 2024. Bank of Baroda (BOB) comes in second with an average ROE of 8.29%, demonstrating a notable increase in profitability from 1.21% in 2020 to 15.67% in 2024. Punjab National Bank (PNB) trails its competitors while having a moderate average ROE of 4.09%, which peaked in 2024 at 8.92%. Union Bank of India (UBI) has recovered remarkably, achieving 14.94% in 2024 with an average of 5.99%, while having a negative ROE of -9.46% in 2020. Indian Overseas Bank (IOB) had the lowest average ROE of -4.33%, mostly because of a sharp decline in ROE of -52.78% in 2020. However, in 2024, they showed improvement, rising to 10.52%. All banks have seen a consistent rise in ROE, which suggests increased operational efficiency, better risk management, and increased profitability. SBI's steady earnings growth and dominant market position are reflected in its continuously high ROE. The quick increase in ROE for BOB and UBI points to improved capital allocation and efficient financial restructuring. Despite previous financial difficulties, IOB has made a strong recovery and is heading in the direction of positive returns. All things considered, PSBs' increasing ROE trend points to increased shareholder value, better capital efficiency, and long-term financial stability.

5.15 Earning Capability (E) :-

A Public Sector Bank's (PSB) ability for earning money is mostly determined by its Net Interest Margin (NIM) and Cost-to-Income (C/I) ratio. A lower Cost-to-Income ratio indicates effective cost control and increased profitability, but a higher NIM indicates better interest income from assets. Strong financial performance, improved returns for shareholders, and operational efficiency are indicated by a steadily rising NIM and a falling C/I ratio.

5.16 Net Interest Margin Ratio (NIM) :-

For Public Sector Banks (PSBs), the Net Interest Margin (NIM), which calculates the difference between interest collected and interest paid in relation to assets, is a crucial profitability metric. While a lower NIM might be an indication of margin pressure brought on by lower lending rates or high funding costs, a higher NIM denotes efficient interest revenue production. A bank's overall profitability is strengthened when its NIM improves since it represents improved asset-liability management, higher loan rates, and regulated funding costs. Sustained NIM growth for Public Sector Banks (PSBs) signifies improved profitability, competitive positioning, and improved financial health.

(In Percent)

BANKS	2020	2021	2022	2023	2024	MIN	MAX	AVG	RANK
SBI	2.59	2.51	2.49	2.7	2.66	2.49	2.7	2.59	2
BOB	2.4	2.58	2.57	2.89	2.92	2.4	2.92	2.67	1
PNB	2.1	2.42	2.19	2.34	2.53	2.1	2.53	2.32	5
UBI	2.07	2.3	2.33	2.55	2.62	2.07	2.62	2.37	3
IOB	2.03	2.15	2.1	2.63	2.79	2.03	2.79	2.34	4

Table 5.8 Net Interest Margin Ratio (NIM) of Selected Public Sector Banks (Source : Secondary Data Collected From Respective Banks)

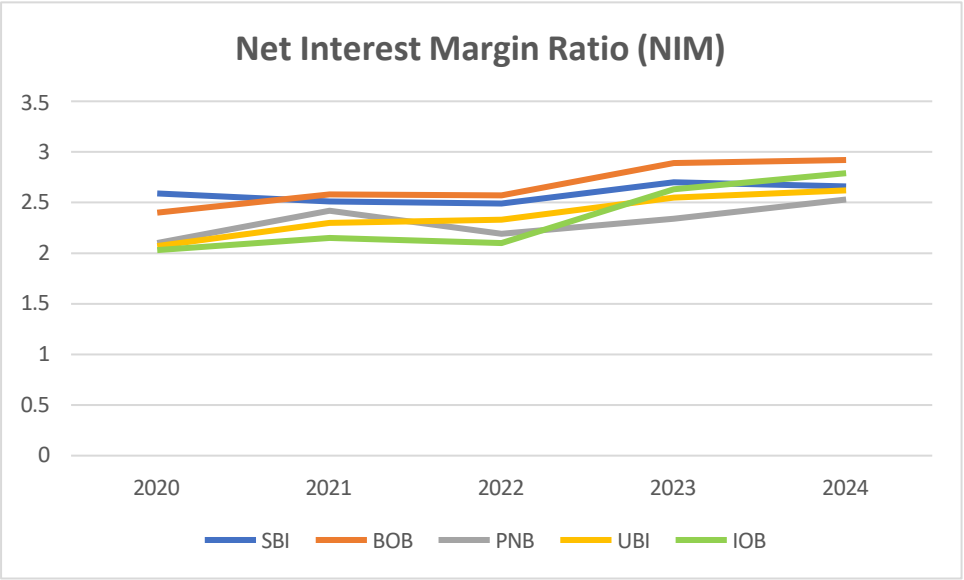

Chart 5.7 Net Interest Margin Ratio (NIM) of Selected Public Sector Banks

Interpretation :- The Net Interest Margin (NIM), which shows the ability of five Public Sector Banks (PSBs) to produce interest income in relation to interest-earning assets, is displayed in the table for the years 2020–2024. With the greatest average NIM of 2.67%, which peaked at 2.92% in 2024, Bank of Baroda (BOB) comes in first place, demonstrating robust interest income and effective asset use. State Bank of India (SBI), which maintains consistency and reaches a peak of 2.7% in 2023, comes in second with an average NIM of 2.59%. With an average NIM of 2.37%, Union Bank of India (UBI) comes in third place. Its growth rate increased steadily from 2.07% in 2020 to 2.62% in 2024. Better asset management is seen by Indian Overseas Bank's (IOB) average NIM of 2.34%, which increased dramatically from 2.03% in 2020 to 2.79% in 2024. The lowest average NIM is 2.32% for Punjab National Bank (PNB), although it has increased from 2.1% in 2020 to 2.53% in 2024. Overall, the pattern points to a steady rise in NIM for all banks, indicating improved loan pricing and more economical deposit management. BOB's steady NIM rise demonstrates sound interest income management and lending practices. SBI's leadership in striking a balance between asset quality and profitability is demonstrated by its steady NIM. An improvement in interest income is indicated by the rising NIM in IOB and UBI, which supports the growth of profitability. All things considered, rising NIM among PSBs points to improved financial performance, effective capital deployment, and increased profits capability.

5.17 Cost to Income (C/I) Ratio :-

The efficiency of a Public Sector Bank (PSB) is evaluated by the Cost-to-Income (C/I) ratio, which compares operating costs to total revenue. Greater profitability and improved cost control are indicated by a lower C/I ratio, but operational inefficiencies are suggested by a larger ratio. Greater operational efficiency, higher revenue generation, and improved cost control are all reflected in improved C/I ratios across PSBs, which support overall financial stability.

(In Percent)

BANKS	2020	2021	2022	2023	2024	MIN	MAX	AVG	RANK
SBI	51.27	53.21	52.68	66.97	70.44	51.27	70.44	58.91	1
BOB	44.02	49.82	47	50.37	47.76	44.02	50.37	47.79	3
PNB	41.9	44.25	42.83	51.48	53.48	41.9	53.48	46.79	4
UBI	46.11	41.34	43.59	46.27	46.41	41.34	46.41	44.74	5
IOB	82.77	47.17	43.93	51.93	56.32	43.93	82.77	56.42	2

Table 5.9 Cost to Income Ratio (C/I) of Selected Public Sector Banks (Source : Secondary Data Collected From Respective Banks)

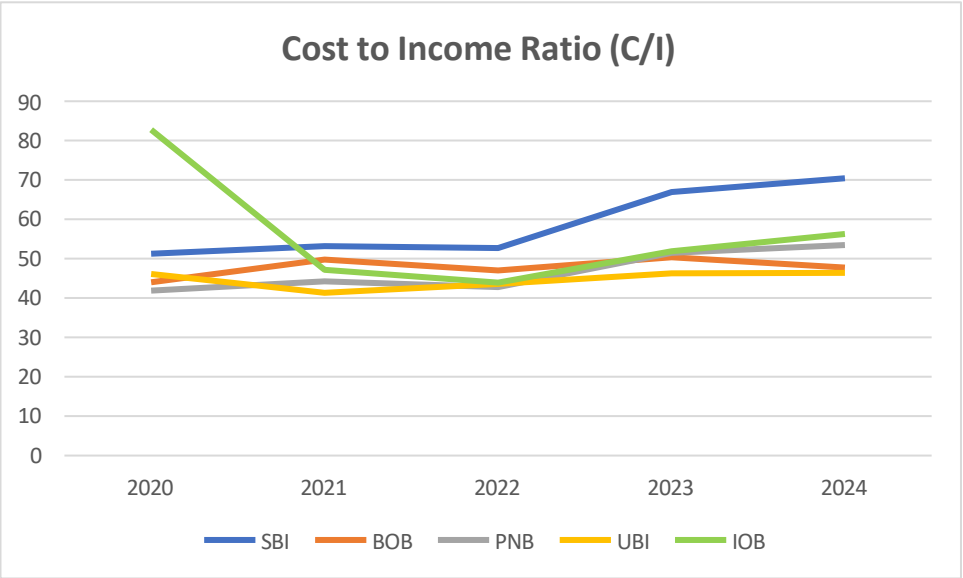

Chart 5.8 Cost to Income Ratio (C/I) of Selected Public Sector Banks

Interpretation :- The Cost-to-Income (C/I) ratio of five Public Sector Banks (PSBs) from 2020 to 2024 is shown in the table, demonstrating how effectively they manage costs in relation to revenue. Despite its dominant position, State Bank of India (SBI) has the highest average C/I ratio (58.91%), reaching a peak of 70.44% in 2024. This suggests that costs are increasing, which could affect profitability. With an average C/I ratio of 56.42%, Indian Overseas Bank (IOB) comes in second, with a notable increase from 82.77% in 2020 to 56.32% in 2024, indicating improved cost control and efficiency. The comparatively steady C/I ratio of 47.79% for Bank of Baroda (BOB), which peaked at 44.02% in 2020, indicates effective revenue production and cost control. The average C/I ratio maintained by Punjab National Bank (PNB) is 46.79%; it increased little in 2023 and 2024, suggesting that improved cost optimisation is required. Among PSBs, Union Bank of India (UBI) has the highest operating efficiency with the lowest C/I ratio (44.74%). According to the overall trend, certain banks' C/I ratios increased in 2023–2024, perhaps as a result of increased operating costs or investments in digital infrastructure. SBI's rising C/I ratio indicates that although its revenue is expanding, expenses are growing more quickly. IOB's dramatic drop from 82.77% to 56.32% suggests improved cost control and substantial restructuring initiatives. The moderate C/I ratios for PNB and BOB show steady efficiency but also indicate potential for improvement. Strong cost control and efficient income creation are indicated by UBI's continuously low C/I ratio. Better profitability is indicated by a lower C/I ratio among banks, but cost constraints may be indicated by a larger ratio. For PSBs to keep a healthy C/I ratio, effective cost control, revenue growth, and digital transformation will be essential.

5.18 Liquidity Capability (L) :-

The CAMEL model's Liquidity Capability assesses a Public Sector Bank's (PSB) capacity to fulfil its long- and short-term commitments without experiencing financial difficulty. It is evaluated using measures that show how well the bank can handle withdrawals and finance lending operations, such as the Credit-to-Deposit (CD), Liquidity Coverage Ratio (LCR), and Current & Savings Account (CASA) ratios. PSBs must maintain optimal liquidity levels since a strong liquidity position guarantees financial stability, lowers default risks, and boosts depositor confidence.

5.19 Liquidity Coverage Ratio (LCR) :-

Public sector banks' (PSBs') Liquidity Coverage Ratio (LCR) indicates how well they can meet short-term liquidity needs by holding a sufficient amount of high-quality liquid assets. Strong financial stability, regulatory compliance, and liquidity management are shown by a consistently high LCR among PSBs, which guarantees resilience in times of economic hardship.

(In Percent)

BANKS	2020	2021	2022	2023	2024	MIN	MAX	AVG	RANK
SBI	129.02	128.98	130.62	129.02	130.62	128.98	130.62	129.65	5
BOB	152.58	171.44	142.78	146	130	130	171.44	148.56	4
PNB	188.44	171.9	165	149	129.22	129.22	188.44	160.71	3
UBI	185.42	174.79	175.38	156.68	144.12	144.12	185.42	167.28	1
IOB	199.55	176.81	172.45	140.58	136.14	136.14	199.55	165.11	2

Table 5.10 Liquidity Coverage Ratio (LCR) of Selected Public Sector Banks (Source : Secondary Data Collected From Respective Banks)

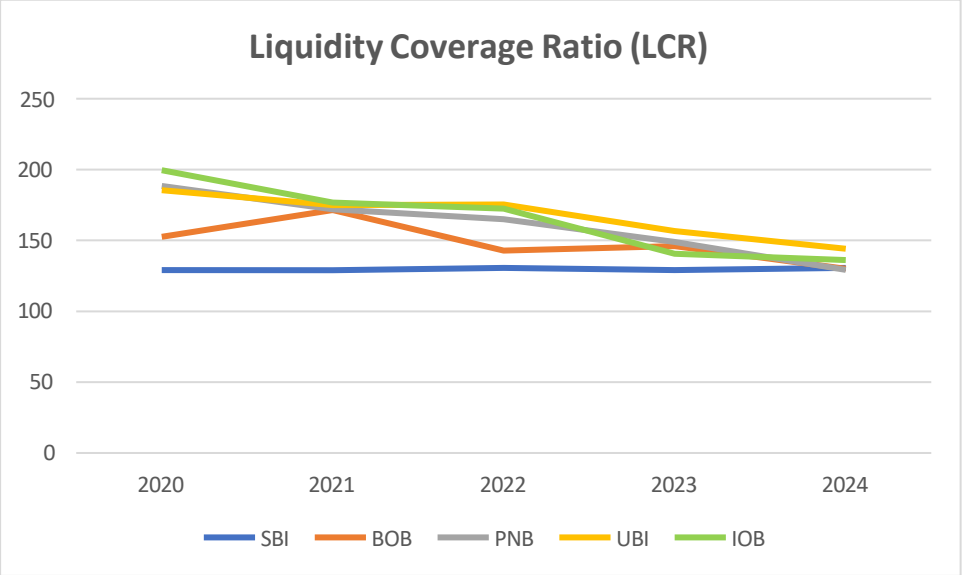

Chart 5.9 Liquidity Coverage Ratio (LCR) of Selected Public Sector Banks

Interpretation :- The table shows the Liquidity Coverage Ratio (LCR) of five PSBs from 2020 to 2024, which shows how well they can handle short-term liquidity

requirements. Having the highest average LCR (167.28%), which peaked in 2020 at 185.42%, Union Bank of India (UBI) guarantees substantial liquidity reserves. Indian Overseas Bank (IOB) comes in second with an average LCR of 165.11%, which indicates a slow tightening of liquidity as it decreased from 199.55% in 2020 to 136.14% in 2024. As a result of changes in liquidity management, Punjab National Bank (PNB) has an average LCR of 160.71%, reaching a peak of 188.44% in 2020 before falling to 129.22% in 2024. Potential liquidity optimisation is shown by Bank of Baroda's (BOB) average LCR of 148.56%, which peaked in 2021 at 171.44% but fell to 130% in 2024. A well-managed but comparatively weaker liquidity position is indicated by State Bank of India's (SBI) lowest average LCR of 129.65%, which stays steady within a small range of 128.98% to 130.62%. The overall pattern indicates a decrease in LCR for the majority of PSBs, which could be brought on by more lending, more asset deployment, or shifting deposit dynamics. Strong liquidity management is indicated by UBI and IOB's higher LCRs, which guarantee resilience in times of financial strain. It could be necessary to closely watch PNB and BOB's falling LCRs in order to strike a balance between liquidity and profitability. The steady LCR of SBI points to a well-thought-out plan for preserving liquidity and optimising asset use. In order to maintain financial stability and depositor confidence, PSBs must continue to maintain a high LCR above statutory norms. Short-term liquidity buffers may be impacted by the strategic shift towards higher lending or investments indicated by the downward trend in LCR across the majority of PSBs. To prevent liquidity crises and guarantee steady growth, it is crucial to keep a balance between profitability and liquidity. In the future, PSBs must concentrate on streamlining their liquidity management plans, guaranteeing adherence to legal requirements while promoting credit growth and economic advancement.

5.20 Loan to Deposits Ratio (LDR) :-

A bank's lending efficiency and liquidity condition are indicated by the Loan-to-Deposit Ratio (LDR), which calculates the percentage of loans to total deposits. While a lower LDR signifies prudent lending, which ensures liquidity but may limit revenue production, a larger LDR suggests aggressive lending, which may boost profitability but also creates liquidity risks. For Public Sector Banks (PSBs) to ensure sustainable financial performance and regulatory compliance, they must

maintain an appropriate LDR that strikes a balance between credit growth and liquidity stability.

(In Percent)

BANKS	2020	2021	2022	2023	2024	MIN	MAX	AVG	RANK
SBI	72.52	67.3	68.36	73.13	76.2	67.3	76.2	71.50	2
BOB	72.6	72.62	74.11	78.05	80.56	72.6	80.56	75.59	1
PNB	67.14	61	63.57	64.9	68.28	61	68.28	64.98	4
UBI	70.21	64.1	64.13	68.22	71.38	64.1	71.38	67.61	3
IOB	54.42	53.15	55.01	68.23	74.56	53.15	74.56	61.07	5

Table 5.11 Loan to Deposit Ratio (LDR) of Selected Public Sector Banks (Source : Secondary Data Collected From Respective Banks)

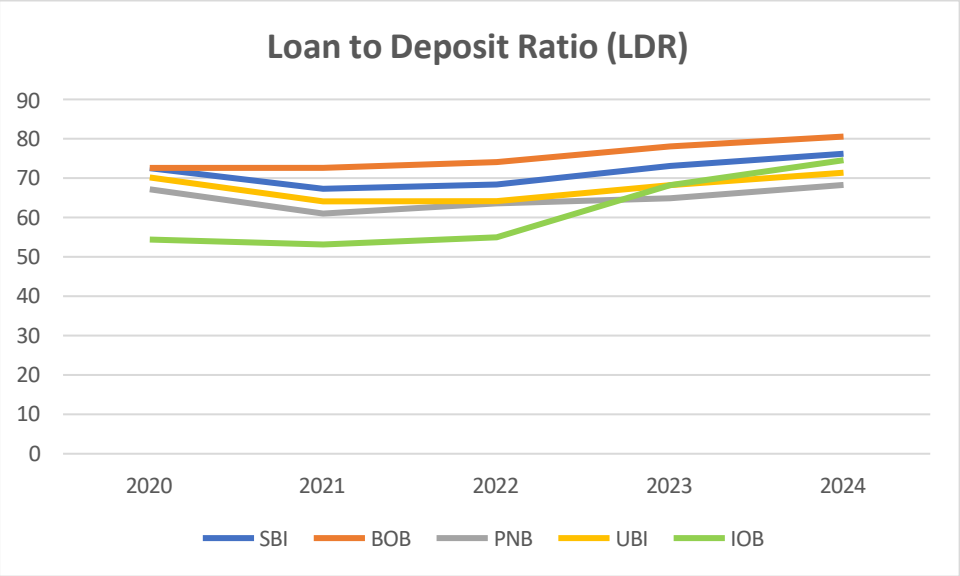

Chart 5.10 Loan to Deposit Ratio (LDR) of Selected Public Sector Banks

Interpretation :- Five Public Sector Banks (PSBs) are shown in the table with their Loan-to-Deposit Ratio (LDR) from 2020 to 2024, which shows how well they lend and how liquid they are. The Bank of Baroda (BOB) exhibits strong loan expansion while preserving liquidity, with the highest average LDR of 75.59%, reaching a peak of 80.56% in 2024. With an average LDR of 71.50%, State Bank of India (SBI) comes in second place.

This figure increased from 67.3% in 2021 to 76.2% in 2024, indicating a deliberate effort for loan expansion. Union Bank of India (UBI) has a moderately fluctuating average LDR of 67.61%, which peaks at 71.38% in 2024 and shows consistent loan growth. The conservative average LDR of Punjab National Bank (PNB) is 64.98%, indicating a steady rise in lending from 61% in 2021 to 68.28% in 2024. The lowest average LDR is 61.07% for Indian Overseas Bank (IOB), however it increased significantly from 53.15% in 2021 to 74.56% in 2024, indicating an aggressive lending strategy in recent years. All PSBs have seen an increase in LDR overall, which suggests that more loans are being disbursed to promote economic growth. The higher LDRs for SBI and BOB point to a more aggressive approach to credit development that strikes a balance between growth and risk. The conservative approach demonstrated by PNB and UBI's moderate LDRs ensures liquidity while growing their loan portfolios. The sharp increase in LDR by IOB points to a change in lending practices from conservative to aggressive, which calls for cautious liquidity management. For PSBs to be profitable without jeopardising their financial stability, they must maintain an ideal LDR.

5.21 Analysis of Single Factor (One – way) ANOVA in CAMEL Model – Based Performance Evaluation of Selected Public Sector Banks of India :-

To evaluate significant variations among banks in important financial indicators, Single-Factor ANOVA analysis is crucial in the CAMEL model-based performance review of Indian public sector banks. It assists in determining the statistical significance of differences in capital adequacy, asset quality, management effectiveness, earnings, and liquidity. This guarantees unbiased comparisons and reveals banks that consistently perform well or poorly. ANOVA helps with policy recommendations by emphasising particular areas that need to be improved. All things considered, it improves the research findings' analytical depth and believability.

5.22 Capital Adequacy (C) :-

Public Sector Banks' (PSBs') capital adequacy is examined using single-factor ANOVA (Analysis of Variance), which compares the mean capital adequacy ratios (CAR) of several banks or time periods. It assists in ascertaining whether notable

variations in capital adequacy exist across various institutions. ANOVA tests the null hypothesis to determine whether variations in CAR are the result of real differences in bank performance or random chance. Using this statistical procedure instead of several t-tests streamlines the comparison process. The banks that differ in their capital adequacy can be further identified using post-hoc testing if the ANOVA result is significant.

5.23 Capital Adequacy Ratio (CAR) :-

The following hypothesis was tested in this section using a one-way ANOVA. Because when you have one independent variable or factor and you want to determine whether changes or varying values of that component have a quantifiable impact on a dependent variable or difference between more than two means, you must employ a one-way analysis.

H_0 : There is no significant difference in Capital Adequacy Ratio among the selected Public Sector Banks during the study period.

H_1 : There is a significant difference in Capital Adequacy Ratio among the selected Public Sector Banks during the study period.

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	3.408144	4	0.85204	0.38177419	0.81900177	2.8660814
Within Groups	44.6356	20	2.2378			
Total	48.04374	24				

Table 5.12 Single Factor ANOVA Test on CAR

Interpretation :- The ANOVA table suggests that there is no significant difference between the groups because the F-statistic (0.3818) is significantly lower than the F-critical value (2.8661) at a 5% significance level. Furthermore, the P-value (0.8190) is significantly

higher than 0.05, suggesting that there is no statistically significant difference in the groups' financial success. The conclusion that the variations between the groups are probably the result of random chance rather than any significant variation is supported by the fact that the within-group variance (SS = 44.6356) is significantly greater than the inter-group variation (SS = 3.4081). As a result, we are unable to rule out the null hypothesis, suggesting that there is no discernible difference in the chosen banks' financial performance.

5.24 Total Advances to Assets Ratio :-

The following hypothesis was tested in this section using a one-way ANOVA.

H_0 : There is no significant difference in Total Advances to Assets Ratio among the selected Public Sector Banks during the study period.

H_1 : There is a significant difference in Total Advances to Assets Ratio among the selected Public Sector Banks during the study period.

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	245.833544	4	61.458386	4.264801143	0.011742957	2.866081402
Within Groups	288.2122	20	14.41061			
Total	534.045744	24				

Table 5.13 Single Factor ANOVA Test on Total Advances to Assets Ratio

Interpretation :- A statistically significant difference between the groups is indicated by the ANOVA table, which shows that the F-statistic (4.2648) is higher than the F-critical value (2.8661) at a 5% significance level. Furthermore, the P-value (0.0117) is less than 0.05, which supports the idea that at least one group is substantially different from the others. The between-group sum of squares (SS = 245.8335) is comparatively high in comparison to the within-group sum of squares (SS = 288.2122), indicating that group differences rather than chance fluctuations account for a sizable amount of the variation in

financial performance. The null hypothesis is thus rejected, and we draw the conclusion that the chosen banks' financial performance differs significantly from one another. In order to identify which particular groups differ, a post-hoc analysis might be necessary.

5.25 Assets Quality (A) :-

To determine whether there are notable variations in the asset quality of Public Sector Banks (PSBs) in India, a single-factor ANOVA test is necessary. Indicators such the Gross Non-Performing Assets (GNPA) ratio, Net Non-Performing Assets (NNPA) ratio, or Provision Coverage Ratio (PCR) across several PSBs can be used to gauge the quality of the assets. To ascertain whether differences are statistically significant, the ANOVA test will compare the means of these variables across other banks. There are notable variations in asset quality amongst PSBs if the p-value is smaller than the selected significance level (e.g., 0.05). The financial stability and risk exposure of PSBs in India are better understood thanks to this analysis.

5.26 Net NPA Ratio (Non – Performing Assets) :-

The following hypothesis was tested in this section using a one-way ANOVA.

H_0 : There is no significant difference in Net NPA Ratio among the selected Public Sector Banks during the study period.

H_1 : There is a significant difference in Net NPA Ratio among the selected Public Sector Banks during the study period.

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	20.990296	4	5.247574	1.6658853143	0.19728637	2.866081402
Within Groups	63.00164	20	3.150082			
Total	83.991936	24				

Table 5.14 Single Factor ANOVA Test on Net NPA Ratio

Interpretation :- The ANOVA table indicates that the differences between the groups are not statistically significant because the F-statistic (1.6659) is less than the F-critical value (2.8661) at a 5% significance level. Furthermore, the P-value (0.1973) is higher than 0.05, indicating that any detected differences in the groups' financial performance are probably the result of chance rather than significant distinctions. The conclusion that the majority of the variance occurs within the groups rather than between them is supported by the fact that the intra-group sum of squares (SS = 63.0016) is noticeably greater than the between-group sum of squares (SS = 20.9903). As a result, the null hypothesis cannot be rejected, suggesting that there is no discernible difference in the chosen banks' financial performance.

5.27 Provision Coverage Ratio (PCR) :-

The following hypothesis was tested in this section using a one-way ANOVA.

H_0 : There is no significant difference in Provision Coverage Ratio among the selected Public Sector Banks during the study period.

H_1 : There is a significant difference in Provision Coverage Ratio among the selected Public Sector Banks during the study period.

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	204.085256	4	51.021314	1.088328952	0.388995074	2.866081402
Within Groups	937.60832	20	46.880416			
Total	1141.693576	24				

Table 5.15 Single Factor ANOVA Test on Provision Coverage Ratio

Interpretation :- According to the ANOVA table, the differences between the groups are not statistically significant because the F-statistic (1.0883) is less than the F-critical

value (2.8661) at a 5% significance level. Furthermore, any detected variance in the groups' financial success is probably the result of random chance rather than real differences, as the P-value (0.3890) is significantly higher than 0.05. Significantly more variety exists within individual groups than between them, as indicated by the within-group sum of squares (SS = 937.6083) than the between-group sum of squares (SS = 204.0853). Consequently, we are unable to rule out the null hypothesis and come to the conclusion that there is no discernible difference in the financial performance of the chosen institutions.

5.28 Management Quality (M) :-

The CAMEL model can be used to assess the management quality of public sector banks (PSBs) in India. To ascertain whether management efficiency varies significantly throughout banks, a single-factor ANOVA test can be used. The test calls for a dependent numerical variable (such as financial measures like return on assets or management efficiency scores) and one independent categorical variable (such as various PSBs). To determine if observed performance differences are statistically significant, ANOVA compares the variance between and within groups. The quality of management in each bank would vary significantly if the p-value was less than 0.05. By presenting actual data on differences in management efficacy among PSBs, this approach improves the research.

5.29 Return on Assets Ratio (ROA) :-

The following hypothesis was tested in this section using a one-way ANOVA.

H_0 : There is no significant difference in Return on Assets Ratio among the selected Public Sector Banks during the study period.

H_1 : There is a significant difference in Return on Assets Ratio among the selected Public Sector Banks during the study period.

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	2.402296	4	0.600574	0.82935027	0.52215665	2.8660814

Within Groups	14.483	20	0.72415			
Total	16.885296	24				

Table 5.16 Single Factor ANOVA Test on ROA Ratio

Interpretation :- The ANOVA table indicates that the differences between the groups are not statistically significant because the F-statistic (0.8294) is less than the F-critical value (2.8661) at a 5% significance level. Furthermore, the P-value (0.5222) is significantly higher than 0.05, indicating that any observed variance in the groups' financial performance is probably the result of chance rather than significant differences. The majority of the variance appears to occur inside individual groups rather than between them, as indicated by the significantly larger within-group sum of squares (SS = 14.483) compared to the between-group sum of squares (SS = 2.4023). As a result, we are unable to reject the null hypothesis and come to the conclusion that the chosen banks' financial performance does not differ significantly.

5.30 Return on Equity Ratio (ROE) :-

The following hypothesis was tested in this section using a one-way ANOVA.

H_0 : There is no significant difference in Return on Equity Ratio among the selected Public Sector Banks during the study period.

H_1 : There is a significant difference in Return on Equity Ratio among the selected Public Sector Banks during the study period.

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	802.225336	4	200.55633	1.116563275	0.376458207	2.866081402
Within Groups	3592.38636	20	179.61932			

Total	4394.61169	24				

Table 5.17 Single Factor ANOVA Test on ROE Ratio

Interpretation :- The ANOVA table suggests that the differences between the groups are not statistically significant because the F-statistic (1.1166) is less than the F-critical value (2.8661) at a 5% significance level. Furthermore, the P-value (0.3765) is much higher than 0.05, indicating that rather than real differences, the observed variation in financial performance across the groups is probably the result of random chance. Most of the variation occurs within individual groups rather than between them, as evidenced by the substantially larger within-group sum of squares (SS = 3,592.3864) than between-group sum of squares (SS = 802.2253). As a result, we are unable to rule out the null hypothesis and come to the conclusion that the chosen banks' financial performance is not significantly different.

5.31 Earning Capability (E) :-

By analysing the financial performance of several banks, a single-factor ANOVA test is necessary to assess the earning potential of Public Sector Banks (PSBs) in India. It assists in identifying whether important profitability indicators like Net Interest Margin (NIM), Return on Equity (ROE), or Return on Assets (ROA) differ significantly amongst PSBs. The statistical validation of performance discrepancies is provided by ANOVA, which analyses variance both within and between bank groups. By determining whether variances result from inherent differences or random fluctuations, this method guarantees an objective assessment. The results can help stakeholders and regulators improve the profitability and efficiency of banks.

5.32 Net Interest Margin Ratio (NIM) :-

The following hypothesis was tested in this section using a one-way ANOVA.

H_0 : There is no significant difference in Net Interest Margin Ratio among the selected Public Sector Banks during the study period.

H_1 : There is a significant difference in Net Interest Margin Ratio among the selected Public Sector Banks during the study period.

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.521816	4	0.13045	2.55111859	0.0709429	2.8660814
Within Groups	1.02272	20	0.05114			
Total	1.544536	24				

Table 5.18 Single Factor ANOVA Test on NIM Ratio

Interpretation :- The ANOVA table examines how different groups' financial performance differs from one another. At the 5% significance level, the F-statistic (2.5511) is marginally less than the F-critical value (2.8661), indicating that there is no statistically significant difference between the groups. The P-value (0.0709) indicates that there is some variation, but not enough to be deemed significant because it is higher than 0.05 but still somewhat near the threshold. The fact that the within-group sum of squares (SS = 1.022) is greater than the between-group sum of squares (SS = 0.5218) suggests that most differences take place within individual groups rather than between them. As a result, we are unable to reject the null hypothesis and come to the conclusion that, although more research may be necessary, there is no discernible difference in the financial performance of the chosen institutions.

5.33 Cost to Income Ratio (C/I) :-

The following hypothesis was tested in this section using a one-way ANOVA.

H_0 : There is no significant difference in Cost to Income Ratio among the selected Public Sector Banks during the study period.

H_1 : There is a significant difference in Cost to Income Ratio among the selected Public Sector Banks during the study period.

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	795.927544	4	198.98189	2.759931025	0.056203907	2.8660814
Within Groups	1441.93376	20	72.096688			
Total	2237.86130	24				

Table 5.19 Single Factor ANOVA Test on Cost to Income Ratio

Interpretation :- The variance in financial performance between several groups is examined in the ANOVA table. The observed differences are not statistically significant, as indicated by the F-statistic (2.7599) being marginally below the F-critical value (2.8661) at a 5% significance level. Furthermore, the P-value (0.0562) is marginally higher than 0.05, indicating that although there is considerable difference between the groups, it falls short of the traditional significance threshold. Most of the variation occurs within individual groups rather than between them, as evidenced by the smaller between-group sum of squares (SS = 795.9275) compared to the within-group sum of squares (SS = 1441.9338). As a result, we are unable to reject the null hypothesis and come to the conclusion that there is no substantial difference in the financial performance of the chosen institutions. The marginal P-value, however, indicates that additional research might be necessary.

5.34 Liquidity Capability (L) :-

In order to compare liquidity ratios across several banks and evaluate the liquidity capacity of Public Sector Banks (PSBs) in India, a single-factor ANOVA test is essential. Key liquidity measurements including the Current Ratio, Liquid Assets to Total Assets, and Credit-Deposit Ratio can be used to ascertain whether there are notable variations. The statistical validation of liquidity performance discrepancies is provided by ANOVA, which analyses variance both within and across bank groups. This method guarantees an unbiased assessment, determining whether variations result from external variables or bank-specific tactics. Policymakers and

regulators can use the findings to improve PSBs' financial stability and liquidity management.

5.35 Liquidity Coverage Ratio (LCR) :-

The following hypothesis was tested in this section using a one-way ANOVA.

H_0 : There is no significant difference in Liquidity Coverage Ratio among the selected Public Sector Banks during the study period.

H_1 : There is a significant difference in Liquidity Coverage Ratio among the selected Public Sector Banks during the study period.

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	4833.88	4	1208.47	3.509826978	0.025126914	2.8660814
Within Groups	6886.2084	20	344.3104			
Total	11720.088	24				

Table 5.20 Single Factor ANOVA Test on Liquidity Coverage Ratio

Interpretation :- Group variations in financial performance are assessed using the ANOVA table. There is a statistically significant difference between the groups, as indicated by the F-statistic (3.5098) being greater than the F-critical value (2.8661) at a 5% significance level. The fact that at least one group differs significantly from the others is confirmed by the P-value (0.0251), which is less than 0.05. Although there is a significant difference, there is also a significant degree of variance within groups, as indicated by the between-group sum of squares (SS = 4,833.88), which is significant but still less than the within-group sum of squares (SS = 6,886.21). We draw the conclusion that there are notable differences in the financial performance of the chosen institutions since the null hypothesis is disproved. To determine which particular groups, differ significantly from one another, more post-hoc analysis is advised.

5.36 Loan to Deposit Ratio (LDR) :-

The following hypothesis was tested in this section using a one-way ANOVA.

H_0 : There is no significant difference in Loan to Deposit Ratio among the selected Public Sector Banks during the study period.

H_1 : There is a significant difference in Loan to Deposit Ratio among the selected Public Sector Banks during the study period.

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	634.92436	4	158.73109	5.668209984	0.003228736	2.8660814
Within Groups	560.07484	20	28.003742			
Total	1194.9992	24				

Table 5.21 Single Factor ANOVA Test on Loan to Deposit Ratio

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CHAPTER :- 6

SUMMARY, FINDINGS, AND SUGGESTIONS

INDEX

6.1 INTRODUCTION :-

An overview of the complete research project is given in the Summary, Findings, and Suggestions section. A concise synopsis of the research problem, goals, methodology, main conclusions, and findings is provided in the summary. Assuring objectivity and evidence – baseness, the findings section highlights the key findings, together with significant observations, trends, and linkages found through data analysis. Last but not least, the recommendations or proposals provide stakeholders with doable steps, ways to improve, future research avenues, and improved application of theories or models. The recommendations ought to be practical, applicable, and pertinent to the study's setting.

6.2 Summary of the Study :-

The research dissertation as a whole has been organised into the following chapters:

1. **Introduction to the Banking Sector and Performance Evaluation in India**
   An overview of the Indian banking industry is given in this chapter, with particular attention paid to its structure, historical development, and regulatory environment. It talks about important reforms and regulatory initiatives put in place to improve the efficiency and stability of public sector banks while highlighting their crucial role in financial inclusion and economic development. The chapter also stresses how crucial it is to assess banking performance in order to guarantee competitiveness, sustainable growth, and financial soundness. A variety of performance evaluation approaches are examined, highlighting the importance of financial metrics in gauging effectiveness, profitability, and risk control. This chapter lays the groundwork for the study by demonstrating the necessity of a methodical assessment of India's public sector banks in line with more general economic and policy goals.
2. **Conceptual Framework of The CAMEL Model & Sample Profile of Banks**
   This chapter describes the CAMEL model's conceptual structure, including its elements and applicability to assessing bank performance. Additionally, it gives a summary of the chosen public sector banks, highlighting their salient operating features and financial profile. In later chapters, an organised

evaluation of banking stability, effectiveness, and financial health is made possible by this basis.

3. **Literature Review**

   This chapter examines the body of research on evaluating the performance of the banking industry, with an emphasis on studies on regulatory effects, efficiency analysis, and financial assessment approaches. It identifies gaps and topics for additional research while highlighting important research findings on Indian public sector banks. The review supports the choice of suitable analytical models and research methodologies by offering a conceptual basis for the investigation.

4. **Research Methodology**

   This chapter describes the research approach used to assess the Indian public sector banks' financial performance. It describes the study's methodology, data sources, sampling strategies, and analytical instruments, such as ANOVA and other statistical procedures. The study's validity and reliability are increased by the chapter's assurance of a methodical approach to data gathering and analysis.

5. **Data Analysis & Data Interpretation**

   The data gathered to assess the financial performance of India's public sector banks is analysed and interpreted in Chapter 5. It evaluates important financial variables using statistical techniques, such as single-factor ANOVA, to find patterns, advantages, and opportunities for development. The conclusions and suggestions in the next chapter are based on the findings, which offer insightful information about the effectiveness, stability, and profitability of these banks.

6. **Summary, Findings, and Suggestions**

   The study's main conclusions are presented in Chapter 6, which also highlights the changes in public sector banks' financial performance according to the evaluation criteria that were selected. It enumerates the advantages and disadvantages noted, offering information on areas in need of development. The chapter ends with actionable ideas and policy proposals to improve public sector banks' competitiveness, stability, and efficiency.

6.3 Findings Based on CAMEL Model :-

Objective :- To evaluate the financial soundness and performance of selected public sector banks in India on the basis of CAMEL model parameters.

6.3.1 C – Capital Adequacy :-

Capital Adequacy Ratio (CAR)

Indian PSBs are required to maintain a minimum CAR of 11.5% to comply with RBI regulations under Basel III norms. All banks have maintained CAR above the RBI-mandated minimum of 11.5% (including CCB) throughout 2020-2024. Indian Overseas Bank (IOB) had the lowest CAR at 10.72% in 2020, which was below the required 11.5%. However, it improved significantly in subsequent years, reaching a high of 17% in 2024. SBI has the lowest rank (5) in the table, but it consistently maintained a CAR above 13%, which is still well within the safe zone. BOB (Rank 1) and PNB (Rank 2) consistently show strong capital adequacy ratios, indicating robust capital positions. UBI and IOB have shown significant improvements over time, with IOB jumping from 10.72% in 2020 to 17% in 2024, demonstrating capital strengthening measures. All banks (except IOB in 2020) have consistently maintained CAR above the RBI-mandated 11.5%, ensuring compliance with Basel III norms. Overall, the capital adequacy of these public sector banks appears acceptable, with no immediate risks of non-compliance. IOB's low CAR in 2020 would have required corrective action, but its improvement by 2024 indicates successful recapitalization efforts.

Total Advances to Assets Ratio

The Advances to Assets Ratio has no predetermined maximum according to RBI or Basel III standards. However, Basel III's Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR) require banks to strike a balance between lending, liquidity, and risk management. While a very low ratio (below 40–45%) might suggest underutilisation of assets for lending, a very high ratio (over 65–70%) might suggest increased risk exposure. In order to maximise earning assets and ensure sufficient liquidity, a moderate range of 50–65% is usually seen as suitable. Every bank has kept the percentage between 46.5% and 65.8%, which is a healthy range,

guaranteeing sufficient lending and liquidity. In 2020, IOB had the lowest Advances to Assets ratio (46.53%), which could indicate more non-lending assets or cautious lending. Later years saw a notable improvement, though, as it reached 60.62% in 2024. In 2024, BOB's lending ratio was the highest at 65.8%, which is still within an acceptable range despite being somewhat high. The steady ratios of 55–58% for SBI, PNB, and UBI show balanced asset use and risk control. Since neither bank shows a dramatic departure, they are neither under lending (inefficient use of assets) nor over lending (high risk).

6.3.2 A – Assets Quality :-

Net Non-Performing Assets (NPA) Ratio

In accordance with Basel III standards, the RBI does not establish a set Net NPA threshold. However, for a bank's stability, smaller NPAs are desired. Banks having a net non-performing asset (NPA) of more than 6% are deemed vulnerable and may be subject to RBI Prompt Corrective Action (PCA). Good asset quality is indicated by a Net NPA of less than 2%, which is typically regarded as acceptable. Through better credit risk management, write-offs, and recovery initiatives, banks want to lower non-performing assets (NPAs). From 2020 to 2024, all banks' Net NPA ratios dropped dramatically, indicating better asset quality. In terms of asset quality, SBI is the best-performing bank with the lowest Net NPA (0.57% in 2024). Although PNB's 2020 Net NPA of 5.78% was risky, it has since dropped to 0.73% in 2024, demonstrating robust recovery efforts. Although they had very high NPAs (over 5% in 2020–21), IOB and UBI were able to drastically reduce them. Every bank is currently well within the RBI's permissible level (<6%), and none of them face immediate PCA risk. Although PNB and UBI's non-performing assets (NPAs) were historically large, their current decline indicates robust recovery efforts and improved credit management. All banks have successfully lowered their net non-performing assets (NPAs) below the crucial 6% threshold, guaranteeing adherence to RBI guidelines. The asset quality of SBI is the highest, followed by that of BOB, IOB, and UBI. Although PNB and UBI's NPAs were formerly alarmingly high, they are now acceptable due to their notable improvement. Overall, Basel III standards have made all banks' net non-performing asset (NPA) ratios acceptable.

Provision Coverage Ratio (PCR)

To make sure banks have enough reserves to cover problematic loans, the RBI advises banks to maintain a minimum PCR of 70%. Unexpected losses are less likely when the PCR is above 80%, which is regarded as strong. A PCR below 70% raises concerns because it implies the bank might not have adequate reserves to cover future non-performing assets. Among the banks, PNB has the strongest provision coverage, as evidenced by its highest PCR (96.67% in 2024). Strong financial resilience has been ensured by all banks, with the exception of UBI in 2020, which has kept its PCR far over the 70% RBI recommends. Consistently high PCR values (over 85%) for SBI and BOB demonstrate strong risk management. IOB dramatically improved its PCR from 76.79% in 2020 to 97.06% in 2024, demonstrating a better provisioning plan. Although UBI's PCR was alarmingly low in 2020 (67%), it improved dramatically in subsequent years to reach an acceptable level (92.69% in 2024). Since all banks currently achieve the 70% PCR that the RBI recommends, their provisioning practices are deemed appropriate. PNB, SBI, BOB, and IOB have robust PCRs that guarantee sufficient risk coverage. In 2020, UBI's provisioning was weak (67%), but by 2024, it had improved to 92.69%, making it compliant. These banks are stable in accordance with Basel III standards because they have a sizable financial cushion to absorb possible loan losses.

6.3.3 M – Management Quality :-

Return on Assets Ratio (ROA)

Although a positive ROA is necessary for long-term financial stability, the RBI does not have a set ROA criterion under Basel III. A ROA of more than 1% is regarded as strong and indicates good profitability. A stable performance is indicated by a ROA of 0.5% to 1%. A ROA of less than 0.5% indicates poor profitability and room for development. A negative ROA raises concerns since it suggests losses and possible instability in the financial system. SBI is the most profitable of these banks, with the highest average ROA (0.70%) and the strongest ROA (0.99% in 2024). By 2024, BOB had increased to 1.13%, which is regarded as high profitability. Prior to 2024, PNB and UBI were not very profitable, with ROAs below 0.5%. However, UBI demonstrated a significant improvement in

2024, with a ROA of 0.98%. Financial strain was indicated by IOB's negative ROA (-3.27% in 2020), which improved to 0.75% in 2024. Its average ROA of -0.20% is still worrisome, though. PNB has to increase its profitability and operational efficiency, as seen by its low ROA, which is typically less than 0.5%. Both SBI and BOB are doing well; in 2024, BOB's ROA will be more than 1%. For PNB and UBI to continue to be profitable, they must make additional improvements. Despite advancements, IOB's historical financial difficulties have left it with the lowest long-term profitability. Banks have generally improved, but in order to maintain long-term financial stability in accordance with Basel III standards, PNB and IOB must increase their profitability.

Return on Equity Ratio (ROE)

Although Basel III does not specify a ROE, a positive and steady ROE is necessary for sound financial management. A ROE of 10% or higher is regarded as robust and denotes significant profitability. While reasonable, a ROE of 5% to 10% indicates moderate profitability. A ROE of less than 5% is substandard and indicates subpar returns for shareholders. Since a negative ROE indicates that the bank is losing money, it is extremely alarming. With the highest average ROE (12.84%) and the strongest ROE (17.31% in 2024), SBI is the most lucrative company for shareholders. BOB was a great performer, increasing from 1.21% in 2020 to 15.67% in 2024. PNB's poor return on equity (ROE)—which is typically below 5%—indicates low profitability and ineffectiveness in producing returns for shareholders. In 2020, UBI's return on equity (ROE) was negative at -9.46%; however, by 2024, it had significantly improved to 14.94%. IOB's long-term average ROE (-4.33%) indicates ongoing financial difficulties, despite an improvement to 10.52% in 2024 from its extremely alarming negative ROE of -52.78% in 2020. Both SBI and BOB are operating profitably and efficiently thanks to their outstanding ROEs. Although UBI has greatly improved, its initial years of negative ROE are concerning. PNB is still weak because of its low profitability, as seen by its ROE, which is typically below 5%. Despite recent gains, IOB still has to be strengthened in order to be deemed financially viable after suffering significant losses. SBI and BOB are the most lucrative companies overall, while

PNB and IOB need to increase how effectively they provide returns for shareholders.

6.3.4 E – Earning Capability :-

Net Interest Margin Ratio (NIM)

A higher NIM is favoured for financial stability, however the RBI does not establish a set NIM requirement under Basel III. A NIM of 3% or higher is regarded as robust and denotes excellent profitability. An appropriate NIM range is 2.5% to 3%, which indicates consistent performance. A NIM below 2.5% indicates reduced profitability from core banking activities due to weaker efficiency. BOB is the most efficient in terms of interest earnings, with the greatest NIM (2.92% in 2024) and the highest average NIM (2.67%). Despite being somewhat below BOB, SBI is doing well with a steady NIM. PNB has the lowest NIM (2.10% in 2020) and consistently maintains it below 2.5%, which suggests that its lending operations are not very profitable. Although UBI and IOB have improved, their initial NIMs were less than 2.5 percent, indicating previous inefficiencies. Although neither BOB nor SBI achieves the optimal 3% level, their NIMs are respectable. Although they have improved somewhat, UBI and IOB are still below ideal. PNB has the lowest NIM, which could affect overall efficiency and profitability. BOB and SBI are the top performers, however none of the banks have a good NIM above 3% overall. The most improvement is needed at PNB.

Cost to Income (C/I) Ratio

A CIR of less than 50% is regarded as efficient, demonstrating excellent cost control and profitability. A moderate CIR of 50% to 60% denotes balanced cost effectiveness. Since high operating costs lower profitability, a CIR above 60% is deemed inefficient. UBI is the most cost-efficient bank, with the lowest average CIR (44.74%). Strong cost management is demonstrated by BOB and PNB, which often keep CIR at 50%. From 51.27% in 2020 to 70.44% in 2024, SBI's CIR climbed dramatically, a symptom of decreased efficiency and growing operating costs. Despite having a very high CIR of 82.77% in 2020, IOB has greatly improved since then. Strong cost control and effective CIRs are features of BOB, PNB, and UBI. As CIR rises above 60%, SBI's efficiency declines, potentially affecting

profitability. Although it has improved, IOB is still a little high in 2024. In general, UBI is the most economical, but SBI needs to improve its cost-control measures.

6.3.5 L – Liquidity Capability

Liquidity Coverage Ratio (LCR)

All banks must maintain liquid assets equal to or greater than their anticipated cash outflows over a 30-day period in order to meet the minimum LCR requirement of 100%. A greater liquidity position and the capacity to fulfil short-term obligations are indicated by a larger LCR (>100%). There is a liquidity risk and non-compliance with a lower LCR (<100%). Every bank complies with Basel III standards by meeting the RBI's minimum LCR requirement of 100%. The strongest liquidity buffer is indicated by UBI's highest average LCR (167.28%). Additionally, PNB and IOB have very high LCRs, indicating effective liquidity management. Despite having the lowest average LCR (129.65%), SBI is still much above the legal minimum. Although BOB's LCR has decreased over time, it is still comfortably above 130%. Every bank complies with RBI Basel III standards and has acceptable LCRs. The three organisations with the best liquidity positions are UBI, PNB, and IOB. Despite having the lowest LCR of any bank, SBI is still above the legal minimum.

Loan to Deposits Ratio (LDR)

RBI LDR Guidelines Range of Ideal LDR: 75% to 90% A larger LDR (>90%) could be a sign of liquidity risk as the bank has reduced its cash reserves through excessive lending. Profitability may be constrained by underutilisation of deposits, as indicated by a lower LDR (<75%). Strong lending activity while preserving liquidity is ensured by a balanced LDR (~75%), which is ideal. Within the ideal range, BOB has the best LDR (75.59%), guaranteeing profits without taking on liquidity risk. SBI is well-managed while being a little below ideal; in 2024, it improved to 76.2%. Lower LDRs (around 65%) for PNB and UBI suggest that they are lending cautiously, which may restrict profitability. With the lowest LDR (61.07%), IOB is underutilising deposits, which could have an effect on growth. With the best LDR, BOB guarantees a healthy ratio of lending to liquidity. SBI needs to continue lending growth even when it is almost at its best. Due to their

comparatively low LDRs, PNB, UBI, and IOB appear to be using cautious lending practices that could restrict their profitability. IOB's incredibly low LDR from previous years (54.42%) suggests poor use of deposits. PNB, UBI, and IOB need to increase their lending activity, while BOB is generally the most effective at using deposits.

6.4 Findings on the basis of CAMEL model ratios with the help of single factor ANOVA

Sr No.	Core Ratios	Encourage Set Ratios	P - Value	H0 (Accept/Reject)
1	Capital Adequacy (C)	Capital Adequacy	0.819	Accepted
		Total Advances to Assets	0.0117	Rejected
2	Assets Quality (A)	Net NPA	0.1972	Accepted
		Provision Coverage Ratio (PCR)	0.3889	Accepted
3	Management Quality (M)	Return on Assets (ROA)	0.5221	Accepted
		Return on Equity (ROE)	0.3764	Accepted
4	Earning Capability (E)	Net Interest Margin	0.0709	Accepted
		Cost to Income (C/I)	0.0562	Accepted
5	Liquidity Capability (L)	Liquidity Coverage Ratio (LCR)	0.0251	Rejected
		Loan to Deposits Ratio (LDR)	0.0032	Rejected

Table 6.1 Overall ANOVA Results

Interpretation :- The table presents the results of a single-factor ANOVA test applied to various financial ratios categorized under the CAMEL model for public sector banks in India. It assesses whether there is a significant difference in each ratio, with the null hypothesis (H0) being either accepted or rejected based on the p-value. A p-value greater than 0.05 leads to the acceptance of H0, indicating no significant difference, while a p-value below 0.05 results in rejection, suggesting a significant difference. For Capital Adequacy (C), the capital adequacy ratio shows no significant variation (p = 0.819),

whereas the total advances to assets ratio differs significantly (p = 0.0117). Asset Quality (A) ratios, including Net NPA and PCR, both exhibit no significant variation, as their p-values exceed 0.05. Management Quality (M) metrics, ROA and ROE, also show no significant variation, indicating consistency across banks. Earning Capability (E) ratios, Net Interest Margin (p = 0.0709) and Cost to Income (p = 0.0562), do not demonstrate significant variation. However, Liquidity Capability (L) ratios—LCR (p = 0.0251) and LDR (p = 0.0032)—indicate significant differences, implying variations in liquidity management among public sector banks.

6.5 General Suggestions as per the CAMEL model Components

- Public sector banks should keep bolstering their capital buffers through careful risk management and sporadic capital infusions to guarantee long-term capital adequacy. To prevent regulatory violations, banks with lower CAR—like IOB in 2020—must proactively put corrective procedures in place. A strong CAR can be maintained with the use of strategic recapitalisation, enhanced asset quality, and effective credit risk management. Financial resilience can also be improved by looking into alternate capital-raising strategies like bond issuance or equity expansion. Banks will be better protected against possible financial instability by routine stress testing and compliance with Basel III standards.
- To guarantee both profitability and liquidity, public sector banks should strive to keep their advances to assets ratio balanced within the ideal range of 50–65%. Banks with lower ratios—such as IOB in 2020—should concentrate on growing prudent lending while controlling risk in order to maximise asset utilisation. Higher ratio institutions, like BOB in 2024, need to keep an eye on credit quality to avoid taking on too much risk. Financial stability can be preserved by fortifying risk management systems and following Basel III's LCR and NSFR regulations. Banks will be able to achieve the ideal balance between loan expansion and liquidity preservation through routine assessment of asset allocation techniques.
- For public sector banks to maintain low Net NPA ratios and stop further declines in asset quality, credit risk management should be strengthened. Proactive monitoring, improved borrower screening, and stringent due diligence in lending can all help reduce the likelihood of defaults. In order to sustain progress, banks with historically large non-performing assets (NPAs), such as PNB and UBI, should

continue to concentrate on recovery mechanisms, restructuring, and write-offs. Asset quality will be further improved by bolstering governance, enhancing risk assessment frameworks, and utilising technology for early warning systems. Long-term financial stability and regulatory compliance will be guaranteed by routine stress testing and compliance with Basel III criteria.

- To guarantee sufficient reserves to cover potential non-performing assets, public sector banks should keep their Provision Coverage Ratio (PCR) high. Banks that previously had low PCRs, like UBI in 2020, must continually increase their provisioning procedures to avert financial risks. Enhancing risk readiness can be achieved by early detection of stressed assets and routine stress testing. Financial resilience will be further strengthened by improving recovery procedures and adjusting provisioning rules to changing risks. To protect against unforeseen losses and guarantee long-term stability, maintaining PCR above 80% should continue to be a top priority.
- Banks in the public sector should concentrate on increasing profitability through better revenue diversification, cost control, and operational efficiency. Increasing high-yield lending and improving asset quality must be the top priorities for banks like IOB and PNB that have historically had low or negative ROA. Returns can be increased by optimising interest margins, decreasing non-performing assets, and improving digital banking services. Effective capital use, targeted investments, and improved financial planning can all lead to sustainable success. Long-term financial stability and growth will be guaranteed by consistent performance reviews and compliance with Basel III regulations.
- By boosting shareholder value, optimising capital utilisation, and improving profitability, public sector banks should concentrate on raising return on equity (ROE). PNB and IOB, two banks with historically poor or negative ROE, need to improve their financial strategy by cutting costs, allocating assets wisely, and diversifying their sources of income. Returns can be increased by increasing high-margin lending, enhancing fee-based revenue, and managing non-performing assets. Operational efficiency can be further increased through digital transformation, improved risk management, and strong governance. To guarantee long-term financial viability and investor confidence, keeping ROE above 10% should be a top objective.

- By increasing lending efficiency and optimising interest income, public sector banks should concentrate on raising their Net Interest Margin (NIM). PNB and other banks with continuously low NIMs need to increase their high-yield loan portfolios and improve their asset-liability management. Margin can be increased by lowering funding costs, expanding low-cost deposits, and refining credit pricing tactics. Profitability from core banking activities will be further increased by fortifying risk assessment and loan recovery procedures. Achieving a strong NIM above 3% for long-term financial stability requires constant observation and calculated changes.
- Public sector banks should concentrate on improving operational effectiveness and cost control in order to maintain a low Cost-to-Income Ratio (CIR). In order to lower overhead expenses, SBI needs to simplify operations, embrace digital banking more widely, and execute cost-cutting measures in light of its growing CIR. Despite advancements, banks such as IOB should keep improving income production and optimising resource use. Maintaining CIR below 50% for increased profitability can be achieved by increasing productivity, strengthening automation, and cutting administrative expenses. Sustained financial performance will be ensured by ongoing cost structure and efficiency monitoring.
- To guarantee resilience against transient liquidity shocks, public sector banks should keep up their robust liquidity coverage ratios (LCR). SBI and other banks with lower LCRs ought to concentrate on maximising high-quality liquid assets in order to further fortify their liquidity buffers. To increase profitability, institutions with larger LCRs—like UBI, PNB, and IOB—should effectively balance lending and liquidity. Maintaining Basel III compliance while maintaining financial stability will be made easier with regular stress testing and liquidity risk assessments. Banks will be able to maintain strong liquidity positions without sacrificing returns through strategic asset allocation and effective liquidity management.
- To sustain profitability and liquidity stability, public sector banks should strive to keep their Loan-to-Deposit Ratio (LDR) between 75% and 90%. In order to increase asset utilisation and boost earnings, banks with lower LDRs—like PNB, UBI, and IOB—should concentrate on expanding their lending activity. SBI should keep up its balanced approach to loan expansion while keeping liquidity buffers in place, since it is nearly within the acceptable range. With the lowest LDR, IOB must improve loan distribution and increase credit outreach in order to maximise deposit

utilisation. Banks can achieve sustainable expansion while reducing liquidity concerns with a well-managed LDR.

6.6 Suggestions on the basis of Single factor ANOVA

Given that the Liquidity Coverage Ratio (LCR) and Loan to Deposits Ratio (LDR) have both demonstrated notable variation, the results indicate that public sector banks in India should concentrate on enhancing their liquidity management. To improve financial stability, it is also essential to optimise the ratio of total advances to assets in order to strengthen capital adequacy. While metrics for managerial effectiveness and asset quality are statistically validated, ongoing observation of ROA and Net NPA is required to guarantee long-term stability. It is important to optimise cost-to-income structures and increase net interest margins in order to increase earnings capabilities. In general, the financial health of these banks can be enhanced by a strategic strategy that prioritises risk management, profitability, and liquidity.

6.7 Conclusion

Based on the CAMEL model's assessment of India's public sector banks, the study concludes that although the majority of banks have sufficient capital and liquidity, large non-performing assets (NPAs) continue to raise concerns about asset quality. Overall profitability and financial stability are impacted by differences in management effectiveness and earnings quality. The single-factor ANOVA test highlights areas that require improvement by revealing substantial disparities in banks' financial performance. Banks should prioritise risk management, operational effectiveness, and profitability in order to improve sustainability. To improve governance and financial stability in the public banking industry, policymakers must enact changes.

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