CHAPTER – 3

RESEARCH METHODOLOGY
3.1. PREFACE: RESEARCH DESIGN

When constructing a building there is no point ordering materials or setting critical dates for completion of project stages until we know what sort of building is being constructed. The first decision is whether we need a high rise office building, a factory for manufacturing machinery, a school, a residential home or an apartment block. Until this is done we cannot sketch a plan, obtain permits, work out a work schedule or order materials.

Similarly, social research needs a design or a structure before data collection or analysis can commence. A research design is not just a work plan. A work plan details what has to be done to complete the project but the work plan will flow from the project's research design.

The function of a research design is to ensure that the evidence obtained enables us to answer the initial question as unambiguously as possible. Obtaining relevant evidence entails specifying the type of evidence needed to answer the research question, to test a theory, to evaluate a programme or to accurately describe some phenomenon. In other words, when designing research we need to ask: given this research question (or theory), what type of evidence is needed to answer the question (or test the theory) in a convincing way?

Research design ‘deals with a logical problem and not a logistical problem’ (Yin, 1989: 29). Before a builder or architect can develop a work plan or order materials they must first establish the type of building required, its uses and the needs of the occupants. The work plan flows from this. Similarly, in social research the issues of sampling, method of data collection (e.g. questionnaire, observation, document analysis), design of questions are all subsidiary to the matter of ‘What evidence do I need to collect?’

Too often researchers design questionnaires or begin interviewing far too early. Before thinking through what information they require to answer their research questions. Without attending to these research design matters at the beginning, the
conclusions drawn will normally be weak and unconvincing and fail to answer the research question

Description and explanation
Social researchers ask two fundamental types of research questions:
What is going on (descriptive research)?
Why is it going on (explanatory research)?

(https://www.nyu.edu)

Descriptive research

Although some people dismiss descriptive research as ‘mere description’, good description is fundamental to the research enterprise and it has added immeasurably to our knowledge of the shape and nature of our society. Descriptive research encompasses much government sponsored research including the population census, the collection of a wide range of social indicators and economic information such as household expenditure patterns, time use studies, employment and crime statistics and the like.
To achieve the set objectives, the researcher has done descriptive research.

3.2 STATEMENT OF RESEARCH PROBLEM

FINANCIAL PERFORMANCE ANALYSIS OF SELECTED PUBLIC AND PRIVATE SECTOR BANKS: A STUDY THROUGH CAMEL MODEL
A research problem refers to some difficulty which a researcher experiences in the context of either a theoretical or practical situation and wants to obtain a solution for the same. Environment, number of courses of action, persons not involved in decision making etc. affects the research problem.

3.2.1 Identification of the problem of the study
In the recent years the financial system especially the banks have undergone numerous changes in the form of reforms, regulations and norms. CAMEL framework for the performance evaluation of banks is an addition to this. Here, for our research
study problem is to analyze financial performance of selected public sector and private sector banks through CAMEL FRAMEWORK and their comparison.

3.3 Objectives of the Study

1. To analyse and interpret the financial performance of the select banks
2. To compare financial performance of public and private sector banks on the basis of ratios covered under CAMEL model
3. To understand the factors which have led to the current financial performance of the select banks
4. To interpret the statistical results drawn out from the research and evaluate the usefulness of CAMEL model in doing so
5. To suggest measures, on the basis of the study results, to improve further the financial performance of the banks under study.

For this research study, analytical methodology has been adopted. This is proper to analyse collected data as the objective is financial performance evaluation. CAMEL FRAMEWORK as a tool for analysing the financial performance of banks.

3.4 Nature, Scope and Population of the study

Research is a process of reaching to unknown things by implementing known things. This study includes mathematics and systematic approach. It is useful for all banks. It covers data collection, data analysis and interpretation, decision making which is beneficial to evaluate financial performance of banks to survive in the competitive markets. The scope of this study is “to compare the two counterparts of Indian banking sectors (public and private) using CAMEL FRAMEWORK as a tool of financial performance evaluation.”

In this research, for comprehensive comparison of public and private banking sector, the researcher has taken 19 banks from each sector.

<table>
<thead>
<tr>
<th>Private Sector banks</th>
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<td>Public Sector Banks</td>
<td>19</td>
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3.4.1 List of Public and Private Banks covered under the study

<table>
<thead>
<tr>
<th>No.</th>
<th>Private Sector Banks</th>
<th>Public Sector Banks</th>
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<tbody>
<tr>
<td>1</td>
<td>Axis Bank</td>
<td>Allahabad Bank</td>
</tr>
<tr>
<td>2</td>
<td>Catholic Syrian Bank Ltd.</td>
<td>Andhra Bank</td>
</tr>
<tr>
<td>3</td>
<td>Development Credit Bank</td>
<td>Bank of Baroda</td>
</tr>
<tr>
<td>4</td>
<td>Dhanlaxmi Bank</td>
<td>Bank of India</td>
</tr>
<tr>
<td>5</td>
<td>Federal Bank</td>
<td>Bank of Maharashtra</td>
</tr>
<tr>
<td>6</td>
<td>HDFC Bank Ltd</td>
<td>CANARA Bank</td>
</tr>
<tr>
<td>7</td>
<td>ICICI Bank</td>
<td>Central Bank of India</td>
</tr>
<tr>
<td>8</td>
<td>IndusInd Bank</td>
<td>Corporation Bank</td>
</tr>
<tr>
<td>9</td>
<td>ING Vysya Bank</td>
<td>Dena Bank</td>
</tr>
<tr>
<td>10</td>
<td>Jammu and Kashmir Bank</td>
<td>IDBI Bank Ltd</td>
</tr>
<tr>
<td>11</td>
<td>Karnataka Bank Ltd</td>
<td>Indian Bank</td>
</tr>
<tr>
<td>12</td>
<td>Karur Vaysya Bank</td>
<td>Indian Overseas Bank</td>
</tr>
<tr>
<td>13</td>
<td>Kotak Mahindra Bank Limited</td>
<td>Oriental Bank of Commerce</td>
</tr>
<tr>
<td>14</td>
<td>Lakshmi Vilas Bank Ltd</td>
<td>Punjab National Bank</td>
</tr>
<tr>
<td>15</td>
<td>Nainital Bank Ltd</td>
<td>State Bank of India</td>
</tr>
<tr>
<td>16</td>
<td>Ratnakar Bank</td>
<td>Syndicate Bank</td>
</tr>
<tr>
<td>17</td>
<td>South Indian Bank</td>
<td>UCO Bank</td>
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<tr>
<td>18</td>
<td>The city union bank</td>
<td>Union Bank of India</td>
</tr>
<tr>
<td>19</td>
<td>Yes Bank</td>
<td>Vijaya Bank</td>
</tr>
</tbody>
</table>

To achieve desired set of objectives, following ratios as per CAMEL model are calculated in this study;
CAPITAL ADEQUACY
1. Capital Adequacy Ratio
2. Debt Equity Ratio
3. Total Advance to Total Asset Ratio
4. Government Securities to Total Investments

ASSET QUALITY
1. Gross NPA Ratio
2. Net NPA Ratio

MANAGEMENT SOUNDNESS
1. Total Advance to Total Deposit Ratio
2. Business per Employee
3. Profit per Employee

EARNINGS AND PROFITABILITY
1. Dividend Pay-out Ratio
2. Return on Asset
3. Interest Income to Total Income
4. Other Income to Total Income

LIQUIDITY
1. Liquidity Asset to Total Asset
2. Government securities to Total Asset
3. Approved Securities to Total Asset
4. Liquidity Asset to Demand Deposit
5. Liquidity Asset to Total Deposit


3.5 HYPOTHESIS TESTING
For the hypothesis testing T-test is applicable because sample size is less than 30. Here in our research study T-test under two sample means is applicable. Following are formulas for T-test calculation.

Hypothesis
µ = Population Mean
µ1 = Population mean of Public sector banks
µ2 = Population mean of Private sector banks

Null hypothesis (Ho): µ1 = µ2
Alternative hypothesis (Ha): µ1 ≠ µ2

\[ T = \frac{\bar{Y}_1 - \bar{Y}_2}{\sqrt{\frac{\hat{S}^2}{n_1} + \frac{\hat{S}^2}{n_2}}} \]

Where,
\[ \hat{S}^2 = \frac{n_1(s_1)^2 + n_2(s_2)^2}{n_1 + n_2 - 2} \]

\( \bar{Y}_1 \) = Sample mean of Public sector banks
\( \bar{Y}_2 \) = Sample mean of Private sector banks
n1 = Number of samples of Public sector banks
n2 = Number of samples of Private sector banks
(s1)^2 = Variance of Public sector banks
(s2)^2 = Variance of Private sector banks

\[ s^2 = \frac{(Y - \bar{Y})^2}{n-1} \]

\( \hat{S}^2 \) = Combine variance of Public sector banks and Private sector banks
(1) CAPITAL RISK ADEQUACY RATIO

Null Hypothesis (Ho):-  
There is no significant difference among Capital Risk Adequacy Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):-  
There is significant difference among Capital Risk Adequacy Ratio of selected public and private sector banks.

(2) DEBT EQUITY RATIO

Null Hypothesis (Ho):-  
There is no significant difference among Debt Equity Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):-  
There is significant difference among Debt Equity Ratio of selected public and private sector banks.

(3) TOTAL ADVANCE TO TOTAL ASSET RATIO

Null Hypothesis (Ho):-  
There is no significant difference among Total Advance to Total Asset Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):-  
There is significant difference among Total Advance to Total Asset Ratio of selected public and private sector banks.
(4) GOVERNMENT SECURITIES TO TOTAL INVESTMENT RATIO

Null Hypothesis (Ho):
There is no significant difference among Government Securities to Total Investment Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):
There is significant difference among Government Securities to Total Investment Ratio of selected public and private sector banks.

(5) GROSS NPA RATIO

Null Hypothesis (Ho):
There is no significant difference among Gross NPA Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):
There is significant difference among Gross NPA Ratio of selected public and private sector banks.

(6) NET NPA RATIO

Null Hypothesis (Ho):
There is no significant difference among Capital Risk Adequacy Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):
There is significant difference among Capital Risk Adequacy Ratio of selected public and private sector banks.
(7) TOTAL ADVANCES TO TOTAL DEPOSIT RATIO

Null Hypothesis (Ho):-
There is no significant difference among Total Advances to Total Deposits Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):-
There is significant difference among Total Advances to Total Deposits Ratio of selected public and private sector banks.

(8) BUSINESS PER EMPLOYEE RATIO

Null Hypothesis (Ho):-
There is no significant difference among Business Per Employee Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):-
There is significant difference among Business Per Employee Ratio of selected public and private sector banks.

(9) PROFIT PER EMPLOYEE RATIO

Null Hypothesis (Ho):-
There would be no significant difference among Profit per Employee Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):-
There would be significant difference among Profit per Employee Ratio of selected public and private sector banks.
(10) DIVIDEND PAY-OUT RATIO

Null Hypothesis (Ho):-
There would be no significant difference among Dividend Pay-out Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):-
There would be significant difference among Dividend Pay-out Ratio of selected public and private sector banks.

(11) RETURN ON ASSETS RATIO

Null Hypothesis (Ho):-
There would be no significant difference among Return on Assets Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):-
There would be significant difference among Return on Assets Ratio of selected public and private sector banks.

(12) INTEREST INCOME TO TOTAL INCOME RATIO

Null Hypothesis (Ho):-
There would be no significant difference among Interest Income to Total Income Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):-
There would be significant difference among Interest Income to Total Income Ratio of selected public and private sector banks.
(13) OTHER INCOME TO TOTAL INCOME RATIO

Null Hypothesis (Ho):-
There would be no significant difference among Other Income to Total Income Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):-
There would be significant difference among Other Income to Total Income Ratio of selected public and private sector banks.

(14) LIQUIDITY ASSETS TO TOTAL ASSETS RATIO

Null Hypothesis (Ho):-
There would be no significant difference among Liquidity Assets to Total Assets Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):-
There would be significant difference among Liquidity Assets to Total Assets Ratio of selected public and private sector banks.

(15) GOVERNMENT SECURITIES TO TOTAL ASSETS RATIO

Null Hypothesis (Ho):-
There would be no significant difference among Government Securities to Total Assets Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):-
There would be significant difference among Government Securities to Total Assets Ratio of selected public and private sector banks.
(16) APPROVED SECURITIES TO TOTAL ASSETS RATIO

Null Hypothesis (Ho):-
There would be no significant difference among Approved Securities to Total Assets Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):-
There would be significant difference among Approved Securities to Total Assets Ratio of selected public and private sector banks.

(17) LIQUIDITY ASSETS TO DEMAND DEPOSITS RATIO

Null Hypothesis (Ho):-
There would be no significant difference among Liquidity Assets to Demand Deposits Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):-
There would be significant difference among Liquidity Assets to Demand Deposits Ratio of selected public and private sector banks.

(18) LIQUIDITY ASSETS TO TOTAL DEPOSITS RATIO

Null Hypothesis (Ho):-
There would be no significant difference among Liquidity Assets to Total Deposits Ratio of selected public and private sector banks.

Alternative Hypothesis (Ha):-
There would be significant difference among Liquidity Assets to Total Deposits Ratio of selected public and private sector banks.
3.6. LITERATURE REVIEW

3.6.1 Related studies

The analysis of banking performance has received a great deal of attention in the banking literature. A popular framework used by regulators is the CAMELS framework, which uses key financial ratios to help evaluate a bank’s performance (Yue, 1992). Several studies involve the use of ratios for banks’ performance appraisal, including Beaver (1966), Altman (1968), Maishanu (2004), and Mous (2005).

1. Beaver (1966)
Beaver (1966) initiated the use of financial ratios for predicting bankruptcy, considering only one ratio at a time.

2. Altman (1968)
Altman (1968) went further, using a multiple discriminant analysis (MDA) for the same purpose, combining several financial ratios in a single prediction model called the Altman’s z-score model. However, Altman’s model ignored the industry-specificity of “healthy” indications by the financial ratios.

Maishanu (2004) studied financial health of banks, and suggested eight financial ratios to diagnose the financial state of a bank.

Mous (2005) studied bankruptcy prediction models of banks using financial ratios of profitability, liquidity, leverage, turnover and total assets in decision tree models and multiple discriminant models, and found that the decision tree approach performed better.

The CAMEL framework was originally intended to determine when to schedule on-site examination of a bank (Thomson, 1991; Whalen and Thomson, 1988). The five CAMEL factors, viz. Capital adequacy, Asset quality, Management soundness,
Earnings and profitability, and Liquidity, indicate the increased likelihood of bank failure when any of these five factors prove inadequate. The choice of the five CAMEL factors is based on the idea that each represents a major element in a bank’s financial statements. Several studies provide explanations for choice of CAMEL measures:

Lane et al. (1986), Looney et al. (1989), Elliott et al (1991), Eccher et al. (1996), and Thomson (1991). For example, Waldron et al (2006) suggested that one of these threats represented in CAMEL exists in the loss of assets (A); similarly, short-term liquid assets (L) aid in covering loan payment defaults and offset the threat of losses or large withdrawals that might occur. The CAMELS framework extends the CAMEL framework, considering six major aspects of banking: Capital adequacy, Asset quality, Management soundness, Earnings and profitability, Liquidity, and Sensitivity to market risk.

5. Wirnkar and Tanko (2008)
The usage of the CAMEL(S) framework in banking studies in emerging economies is limited. Wirnkar and Tanko (2008) studied banking performance of major Nigerian banks using the CAMEL framework. Very recently, Sangmi and Nazir (2010) have studied banking performance of two Indian banks using the CAMEL framework. Also, Agarwal and Sinha (2010) have studied the performance of microfinance institutions in India using the CAMEL framework.

6. CAMEL rating system (Keeley and Gilbert)
This study uses the capital adequacy component of the CAMEL rating system to assess whether regulators in the 1980s influenced inadequately capitalized banks to improve their capital. Using a measure of regulatory pressure that is based on publicly available information, he found that inadequately capitalized banks responded to regulators' demands for greater capital. This conclusion is consistent with that reached by Keeley (1988).
Yet, a measure of regulatory pressure based on confidential capital adequacy ratings reveals that capital regulation at national banks was less effective than at state-chartered banks. This result strengthens a conclusion reached by Gilbert (1991)
7. **Banks performance evaluation by CAMEL model (Hirtle and Lopez)**

Despite the continuous use of financial ratios analysis on banks performance evaluation by banks' regulators, opposition to it skill thrive with opponents coming up with new tools capable of flagging the over-all performance (efficiency) of a bank. This research paper was carried out; to find the adequacy of CAMEL in capturing the overall performance of a bank; to find the relative weights of importance in all the factors in CAMEL; and lastly to inform on the best ratios to always adopt by banks regulators in evaluating banks’ efficiency.

In addition, the best ratios in each of the factors in CAMEL were identified. For example, the best ratio for Capital Adequacy was found to be the ratio of total shareholders' fund to total risk weighted assets. The paper concluded that no one factor in CAMEL suffices to depict the overall performance of a bank. Among other recommendations, banks' regulators are called upon to revert to the best identified ratios in CAMEL when evaluating banks performance.

8. **CAMEL model examination (Rebel Cole and Jeffery Gunther)**

To assess the accuracy of CAMEL ratings in predicting failure, Rebel Cole and Jeffery Gunther use as a benchmark an off-site monitoring system based on publicly available accounting data. Their findings suggest that, if a bank has not been examined for more than two quarters, off-site monitoring systems usually provide a more accurate indication of survivability than its CAMEL rating. The lower predictive accuracy for CAMEL ratings "older" than two quarters causes the overall accuracy of CAMEL ratings to fall substantially below that of off-site monitoring systems.

The higher predictive accuracy of off-site systems derives from both their timeliness-an updated off-site rating is available for every bank in every quarter-and the accuracy of the financial data on which they are based. Cole and Gunther conclude that off-site monitoring systems should continue to play a prominent role in the supervisory process, as a complement to on-site examinations.
9. Check the Risk taken by banks by CAMEL model
The deregulation of the U.S. banking industry has fostered increased competition in banking markets, which in turn has created incentives for banks to operate more efficiently and take more risk. They examine the degree to which supervisory CAMEL ratings reflect the level of risk taken by banks and the risk-taking efficiency of those banks (i.e., whether increased risk levels generate higher expected returns). Their results suggest that supervisors not only distinguish between the risk-taking of efficient and inefficient banks, but they also permit efficient banks more latitude in their investment strategies than inefficient banks.

10. Bank soundness - CAMEL ratings – Indonesia (Kenton Zumwalt)
This study uses a unique data set provided by Bank Indonesia to examine the changing financial soundness of Indonesian banks during this crisis. Bank Indonesia's non-public CAMEL ratings data allow the use of a continuous bank soundness measure rather than ordinal measures. In addition, panel data regression procedures that allow for the identification of the appropriate statistical model are used.

They argue the nature of the risks facing the Indonesian banking community calls for the addition of a systemic risk component to the Indonesian ranking system. The empirical results show that during Indonesia's stable economic periods, four of the five traditional CAMEL components provide insights into the financial soundness of Indonesian banks. However, during Indonesia's crisis period, the relationships between financial characteristics and CAMEL ratings deteriorate and only one of the traditional CAMEL components—earnings—objectively discriminates among the ratings.

11. CAMELs and Banks Performance Evaluation (Muhammad Tanko)
Despite the continuous use of financial ratios analysis on banks performance evaluation by banks' regulators, opposition to it skill thrive with opponents coming up with new tools capable of flagging the over-all performance (efficiency) of a bank. This research paper was carried out; to find the adequacy of CAMEL in capturing the overall performance of a bank; to find the relative weights of importance in all the factors in CAMEL; and lastly to inform on the best ratios to always adopt by banks
regulators in evaluating banks' efficiency. The data for the research work is secondary and was collected from the annual reports of eleven commercial banks in Nigeria over a period of nine years (1997 - 2005). The purposive sampling technique was used. The findings revealed the inability of each factor in CAMEL to capture the holistic performance of a bank. Also revealed, was the relative weight of importance of the factors in CAMEL which resulted to a call for a change in the acronym of CAMEL to CLEAM. In addition, the best ratios in each of the factors in CAMEL were identified. The paper concluded that no one factor in CAMEL suffices to depict the overall performance of a bank. Among other recommendations, banks' regulators are called upon to revert to the best identified ratios in CAMEL when evaluating banks performance.

When we were searching for the research paper for literature review, we could not find a single report or any research paper on the CAMELS model prepared on Indian Banks. Though it may be prepared by them but we have not found. So we inspired to make the project report on CAMELS Model especially on Indian Banks.

12. Dash and Das (2010)
Dash and Das has analyzed the banking sector of India using camels model. The analysis was performed for a sample of fifty-eight banks operating in India, of which twenty-nine were public sector banks, and twenty-nine were private sector/foreign banks. The study covered the financial years 2003-04, 2004-05, 2005-06, 2006-07, and 2007-08 (i.e. Prior to the global financial crisis). The data for the study consisted of financial variables and financial ratios based on the CAMELS framework, obtained from the capitaline database. The results show that private banks / foreign banks are better than in the public sector, the factors that most studies to reduce the camels. These two factors in order is to improve the performance of private banks / foreign-run and accurate and profitability. The results of the study suggest that public sector banks have to adapt quickly to changing market conditions, in order to compete with private/foreign banks. This is particularly due to the wide difference in their credit policy, customer service, ease of access and adoption of it services in their banking system. Public sector banks must improve their credit lending policies so as to improve asset quality and profitability.
13. **Swam and Subrahmanyam (1994)**
They tried to study inter-bank differences in the performance of public sector banks in India with “Taxonomic method”. They found that many banks show wide disparities in their measures of performance.

In her thesis titled, “Profits and Profitability of Indian Nationalised Banks” opined that the banks have become an instrument to meet effectively the needs of the development of the economy to effect the total socioeconomic transformation. It has adversely affected the profitability of the bank operations. According to the researcher, the profitability of a bank is determined and affected mainly by two factors: spread and burden. The other factors determining bank’s profitability are credit policy, priority sector lending, massive geographical expansion, increasing establishment expenses, low non-fund income, deposit composition etc. She has chosen 11 factors affecting a bank’s profitability to identify the most significant variable affecting its profitability.

15. **Krishna (1996)**
In his article titled, “Profitability Analysis: An Overview”, has defined the profitability analysis in detail. According to the researcher, it is a rate expressing profit as a percentage of total aspects or sales or any other variable to represent assets or sales. What should be used in the numerator and the denominator to compute the profit rate depends upon the objective for which it is being measured.

While comparing the financial performance of private sector banks since 1994-95, explained that the private sector banks have delivered a new banking experience. Looking to the growing popularity of services provided by them, their public sector counterparts have started emulating them. He studied the performance of these banks in terms of financial parameters like deposits, advances, profits, return on assets and productivity.

The findings of the study showed that public sector banks performed significantly better than the private sector banks but in no way different from foreign banks.
In this study, a comparison of public, private and foreign banks in India has been made using data envelopment analysis (DEA). In DEA, physical quantities of inputs and outputs are used. Therefore measures of efficiency based on output-input quantities may be more suitable.

In the Indian context, the approach of using deposits and loans as output have been appropriate in the nationalised era when maximising these was indeed the objective of a bank. But the main business of the banks is to maximise their profits. Interest expense and operating expense are treated as input when amount to maximising revenue. Finally they concluded that the superior performance of PSBs is to be described higher technical efficiency rather than higher allocative efficiency.

A panel discussion was arranged to judge the best bank in the Indian banking sector on the basis of certain selected variables. For the purpose of the panel discussion, Business India looked closely at 24 banks.
The selection was based on consideration, such as size and visibility the panellist pick the 24 contenders from each of the three categories of banks – the PSU, private and foreign banks. The profile of the banks that caught the attention includes banks which were clearly leaders in selected areas. The panellists selected a few broad parameters to evaluate the contenders in the first round to produce a short list. Such parameters included financial and operational performance, quality of management, the creation of a platform for growth, value creations and how the stockholders have reacted to the same.
In Round-I, thirteen banks were short listed; and during Round-II, six banks were selected; and finally in Round-III, two banks, i.e., HDFC Bank and ICICI Bank competed with each other. The methodology used by the panelists was CRAMEL Model based on different ratios computed under each measure like Capital adequacy, Resources deployed, Assets quality, Management efficiency, Earning quality and Liquidity.

Finally, ICICI Bank was selected Business India’s Best Bank for 2006. On current form, it is only a matter of time before the ICICI group emerged the country’s biggest financial powerhouse. In several of the business line, it has built significant market shares, be it home loan or vehicle loan or insurance. Within five years of turning into full- fledged bank, it has shown the world that India can build world class institutions.


They made an attempt to review the performance of banking sector in India during the post-reforms period. Banking sector being an integral part of Indian financial system has undergone dramatic changes reflecting the on-going economic and financial sector reforms. The main objective of these reforms has been to strengthen the banking system amongst international best practices and standards, which will have lasting effect on the entire fabric of Indian financial system. These financial sector reforms have stimulated greater competition convergence and consolidation in Indian banking sector.

For the purpose of analysis, banks have been broadly categorized into four categories, i.e., private sector, foreign banks, nationalized banks, and SBI and its associates. They made a comparative appraisal of banks on the basis of seven key performance measures such as returns on assets (ROA), capital asset, risk weighted ratio, NPA to net advances, business per employee, net profitability ratio, NPA level and off-balance-sheet operations of commercial banks for a time period of 9 years, i.e., 1996-2005.

The researchers deliberated the latest trends and developments in the banking sector. The analysis reveals that there is phenomenal development in the banking sector particularly in PSBs. Their performance is comparable with banks in other sectors, yet
they are lagging behind in thrust areas, such as asset quality, business per employee, capital adequacy requirements and profitability. The study concluded with some suggestions for improvement in performance of PSB like operating cost, rationalization of staff cost, HRD, NPA reduction, deployment of funds in quality assets, technology up-gradation, risk management techniques, market-driven approach, instance relationship management and credit delivery mechanism etc. With India getting increasingly integrated with the global financial world, the Indian banking sector has still a long way to go to catch up and compete with their counterparts in the west.

20. Singla (2008), in his research paper titled “Financial Performance of Bank in India”, examined how financial management plays a crucial role in the growth of banking. During 2005-06, bank credits witnessed a strong expansion and a steady growth in deposits was also observed. Currently, banking in India is considered as fairly mature in terms of supply, product range and reach. In terms of quality of supply, assets and capital adequacy, Indian banks are considered to have strong and transparent position. As Indian economy is constantly growing especially the service sector, the demand for banking services is also expected to be stronger. Indian banking stands at a threshold of a mega change in the next 3-5 years. Many new situations are predicted to emerge. The study is conducted by examining the profitability of the selected sixteen banks (BANKEX-based) for the period of six years (2000-01 to 2006-07). For this purpose, the researcher computed various (Nine) ratios, which throw light on the various dimensions of the business. The study revealed that the profitability position was reasonable during the period of study when compared with previous years. Return on investment (ROI) proved that the overall profitability and the position of the selected banks were sustained at a moderate rate. With respect to debt-equity position, it was evident that the banks were maintaining 1:1 ratio, though at one point of time it was quite high. Interest coverage ratio was continuously increasing. Capital adequacy ratio was constant over a period of time. It was also observed that return on net worth had a negative correlation with debt-equity ratio. Interest income to working funds also had a negative association with interest coverage ratio and NPA to Net advances was negatively correlated with interest coverage ratio.
Finally, the researcher predicted that with the increasing level of globalization of Indian banking industry and the evolution of universal banks, competition in the banking industry would intensify further. Though the potential and ability exist, Indian banks have to be faster now to sustain the growth. On the basis of this study, it can be concluded that financial position of banks is reasonable. Debt-Equity ratio is maintaining an adequate level throughout and NPA also witnessed a decline. The ROI remains at a very low position, which is a worrying factor. The banking sector system, which is going through major reforms is one of the emerging sector and will grow at a sustained rate over a period of time.

3.6.2 STUDIES RELATED TO CAMEL FRAMEWORK

They made an attempt to derive rating based on CAMEL. In their study, based on these five groups (C-A-M-E-L), 21 parameters in all were developed. After deriving separate rating for each parameter, a combined rating was derived for all nationalised banks (19) for the year 1998. The study found that Corporation Bank has the best rating followed by Oriental Bank of Commerce, Bank of Baroda, Dena Bank, Punjab National Bank, etc. And the worst rating was found to be of Indian Bank preceded by UCO Bank, United Bank of India, Syndicate Bank and Vijaya Bank.

He analysed the performance of Indian banks by adopting the CAMEL Model. The performance of 65 banks was studied for the period 2003-04. The author concluded that the competition was tough and consumers benefited from it. Better services quality, innovative products, better bargains are all greeting the Indian customers. The coming fiscal will prove to be a transition phase of Indian banks, as they will have to align their strategic focus to increasing interest rates.

studied the capital adequacy requirement of banks and the measures adopted by them to strengthen their capital ratios. The author highlighted that the rating agencies give
prominence to Capital Adequacy Ratios of banks while rating the bank’s certificate of deposits, fixed deposits and bonds. They normally adopt CAMEL Model for rating banks. Thus, Capital Adequate is considered as the key element of bank rating.

4. Satish et al. (2005)
adopted CAMEL model to assess the performance of Indian banks. The authors analyzed the performance of 55 banks for the year 2004-05, 49 using CAMEL Model. They concluded that the Indian banking system looks sound and Information Technology will help the banking system grow in strength while going into future. Banks’ initial public offers (IPOs) will be hitting the market to increase their capital and gearing up for the Basel-II norms.

In their paper, made an attempt to examine and compare the performance of two largest banks of India - SBI, a public sector bank; and ICICI a private sector bank - through CAMEL Model. The present supervision system in banking sector is a substantial improvement over the earlier system in terms of speed, coverage and focus and also the tool employed. Two supervisory rating models based on CAMEL (Capital Adequacy, Assets Quality, Management, Earning, Liquidity, Systems and Controls) and CACS (Capital Adequacy, Assets Quality, Compliance, Systems and Controls) factors for ranking the Indian and foreign banks have been operating. These models have been worked out on the recommendation of Padamanabhan Working Group (1995).

These ratings would enable the RBI (Control Bank) to identify the banks whose conditions warrant special supervision attention. The paper aims to describe the CAMEL Model of rating / ranking banking institutions so as to catch up the comparative performance of various banks. CAMEL is basically a ratio-based model for evaluating the performance of banks. Various ratios are computed under each parameter of CAMEL Model so as to compute the overall ranking of the banks.

While ranking of SBI and ICICI according to average of CAMEL Model ratios for the period 2000 to 2005, the study has brought many interactive results of both the banks. Both SBI and ICICI are performing excellently since beginning of the 21st century.
However, in respect to some of parameter of performance, SBI has outperformed ICICI bank. These are: G. Securities to Total Investments, Spread to Total Assets, Interest Income to Total Income, Liquid Assets to Total Assets, G. Securities to Total Assets, etc. In contrast, ICICI has done better than SBI with regard to Advances to Assets, Total Advances to Deposits, Business per Employee, Profit per Employee, Non-interest Income to Total Income, Liquid Asset to total Deposits etc. The study concluded that on the whole, ICICI bank has performed better than SBI.


revealed that the Indian banking system has come a long way since independence going through different phases of nationalization and liberalization and is now preparing itself for the very critical phase, i.e., 50 Globalization. The liberalization phase brought out the best in the industry inducing competition among banks. During this period, banks were re-structured, shed the flab of over-employment, embraced technology, ventured into new business and re-branded themselves to cater over-demanding customers. In a nutshell, banks across the board have improved their profits while reducing their operational costs. Having reached a comfortable position, Indian banking is cautiously preparing itself to take the next big leap.

Given this background and the development of the banking sector, it is interesting to see how the banks have performed in financial year 2005-06. The researchers undertook a study of the banking sector based on their annual results for the year 2005-06 using CAMEL model. The study covered 59 banks consisted of 25 public sector banks (including the SBI and its associates), 14 private sector banks (old and new) and 20 foreign banks.

Under CAMEL model, the researchers analysed the performance of the above 59 banks by ranking these banks on the basis of capital adequacy, asset quality, management, earning quality and liquidity. Subsequently, they computed composite average ranking of the public, private banks and foreign banks. For the performance snapshot, they made use of additional indicators like total income, interest income, profit after tax, operating profit, deposits, advances and total assets. They believed
that the coming year will see more and more banks restructuring, re-organizing as well as re-branding themselves to face tough competition. This could also increase the much awaited pace of consolidation in the industry. Though India has many banks, none of them has reached the global scale and are nowhere comparable to global banking giants. They suggested that on-going developments in the Indian economy should scale up quality global banks both in size and in quality of service.

7. Sisodiya et al. (2007)

adopted CAMEL model to assess the performance of Indian banks. The authors analysed 67 banks for the year 2006-07. On the basis of composite ranking of all the selected banks, they selected 10 CAMEL topper banks under public sector, private sector and foreign banks category. They concluded that with the buoyancy in the overall economy led by robust corporate performance, the banking sector reported sterling performance. A host of 51 positives characterised the banking sector in the country during 2006-07. The banking sector’s performance is seen as the replica of economic activities of the nation as the healthy banking system acts as the bedrock of solid economic and industrial growth of a nation. As India celebrates its 60th independence anniversary and an amazing ascendance as one of the fastest growing economies in the world (second only to China), one sector which had played a vital role in propping up its economy is undoubtedly the banking sector.

To assess the performance and assign the rank, the globally renowned model, CAMEL was used. The acronym ‘CAMEL’ refers to five components of a bank’s condition that is assessed: Capital Adequacy, Assets Quality, Management, Earnings and Liquidity.

8. Sisodiya et al. (2008)

In their article titled, “Indian Banking Industry: Sustaining the Growth Momentum” revealed that the banking sector in India has once again come out with another fiscal of robust performances. This is commendable given the fact that the banking environment has suddenly become quite challenging after the US subprime crisis which resulted in an unprecedented global liquidity crunch. The fiscal also confirmed the end of the era of benign interest rates as the country’s apex bank embarked on a belt-tightening spree and with a series of tougher measures. This has nevertheless
posed significant challenges to the banks to maintain the growth momentum of the last few years.

The authors ranked banks on the basis of the famous CAMEL (Capital Adequacy, Assets Quality, Management, Earning and Liquidity) rating. They analysed 68 banks for the year 2007-08. On the basis of ranking of each measure of CAMEL Model, they selected five banks under Capital Adequacy winner (PSU banks), Assets Quality winner (Private sector banks), Management Efficiency winner (PSU banks), Earning Quality winner (Private sector banks) and Liquidity winner (PSU banks).

In their article said that the Indian banking has shown remarkable resilience even amidst the worst ever financial catastrophe that hit the global economy about a year ago and caused the collapse of several financial giants. Now, with the effects of the carnage in the global banking sector subsiding and Financial numbers being out, all eyes are on the performance of domestic banking sector. While it would not be correct to expect a repetition of the solid performances that banks delivered in the past 3-4 fiscal years, their performances for the fiscal just gone by are not disappointed either.

They have ranked the banks on the basis of CAMEL rating. Banks have been classified into three categories based on their ownership group, viz. public sector banks (PSBs), private sector banks and foreign banks. They analysed 66 banks for the year 2008-09. The ranking threw several surprises. The top ranked bank among public sector banks is the Bank of Baroda, which has undergone a significant facelift in the recent years. It is followed by Punjab National Bank and Bank of India which too have shown lot of aggression in recent times. The result in case of private sector banks are also unexpected, City Union Bank, ahead of many high profile names. Yes Bank, a late entrant retained its last year ranking of No. 2 among the private sector banks. Among the foreign banks, Bank of Ceylon replaced last year’s winner Shinhan Bank, jumping 15 ranks to emerge as the No. 1 bank this year, while the latter drops to the second rank.
3.7 Period of the Study

The period for evaluating performance through CAMEL in this study is six years, i.e. from financial year 2007-08 to 2012-13. The data is collected from various sources as follows.

3.8 Data Collection

The researcher has used secondary data for the study. The data has been collected from sources like

- Brochure of selected banks
- Annual reports of all selected banks
- Banks’ website
- RBI website
- Earlier researches

3.9 Tools and Techniques

There are many accounting and statistical techniques used for the critical analysis of the collected data. Below given are list of the tools and techniques used for analysis:

3.9.1 RATIO ANALYSIS:

Financial ratios are mathematical comparisons of financial statement accounts or categories. These relationships between the financial statement accounts help investors, creditors, and internal company management understand how well a business is performing and areas of needing improvement. Ratios allow us to compare companies across industries, big and small, to identify their strengths and weaknesses.

Financial ratios are often divided up into six main categories: liquidity, solvency, efficiency, profitability, market prospect, investment leverage, and coverage.

Financial ratio analysis is a useful tool for users of financial statement. It has following advantages:
Advantages

- It simplifies the financial statements.
- It helps in comparing companies of different size with each other.
- It helps in trend analysis which involves comparing a single company over a period.
- It highlights important information in simple form quickly. A user can judge a company by just looking at few numbers instead of reading the whole financial statements.

Limitations

- Despite usefulness, financial ratio analysis has some disadvantages. Some key demerits of financial ratio analysis are:
- Different companies operate in different industries each having different environmental conditions such as regulation, market structure, etc. Such factors are so significant that a comparison of two companies from different industries might be misleading.
- Financial accounting information is affected by estimates and assumptions. Accounting standards allow different accounting policies, which impairs comparability and hence ratio analysis is less useful in such situations.
- Ratio analysis explains relationships between past information while users are more concerned about current and future information.

3.9.2 COMMON SIZE FINANCIAL STATEMENT

A company financial statement that displays all items as percentages of a common base figure. This type of financial statement allows for easy analysis between companies or between time periods of a company.

Advantages:

- It reveals Sources and Application of Funds in a nutshell which help in taking decision.
- If common size statements of 2 or more years are compared it indicate the changing proportion of various components of Assets, Liabilities, Cost, Net Sale & Profit.
- When Inter Firm Comparison is made with the help of Common size statement it helps in doing corporate evaluation and Ranking.

**Disadvantages:**

- No Established Standard Proportion: Common Size Statements are regarded as useless as there is no established standard proportion of an asset to the total asset or an item of expense to the net sales.
- Consistency Required:-If Financial Statement of a Particular business organization are not prepared year after year on a consistent basis comparative study of common size statement will be misleading.

### 3.9.3. COMPARATIVE STATEMENT ANALYSIS

A statement which compares financial data from different periods of time. The comparative statement lines up a section of the income statement, balance sheet or cash flow statement with its corresponding section from a previous period. It can also be used to compare financial data from different companies over time, thus revealing the trend in the financials.

### 3.9.4. TREND ANALYSIS

An aspect of technical analysis that tries to predict the future movement of a stock based on past data. Trend analysis is based on the idea that what has happened in the past gives traders an idea of what will happen in the future. There are three main types of trends: short-, intermediate- and long-term.

**Advantages**

- With the widespread availability of data in virtually every field and the computer’s capability to process it, applications for trend analysis seem almost limitless. Since a trend analysis is based on verifiable data, it can be subjected to thorough scrutiny for validation. The use of numbers makes the analysis...
more exacting. A trend analysis can be replicated, checked, updated and refined when necessary.

**Disadvantages**

- Historical data may not give a true picture of an underlying trend. An obvious event like hurricanes Katrina and Sandy will distort a normal business trend line, while others are more subtle. A major problem in forecasting trends involves identifying turning points. With hindsight, turning points are clearly visible, but it can be difficult to tell in the moment whether they are mere aberrations or the beginning of new trends. Long-term projections need more data to support them, and that may not always be available, particularly for a new business or product line. In any case, the further out one forecasts, the greater the possibility for error, because the passage of time will inevitably introduce new variables.

3.9.5. **VALUE ADDED STATEMENTS**

A value added statement (VAS) is a statement showing the net added value of a business firm during a certain period on its total transaction. The main purpose of value added statement (VAS) is to ascertain how much of the total net value was added and how it was distributed to the contributors of the value. Therefore, a value added statement (VAS) is regarded as a part of social responsibility accounting. A value added statement shows the wealth or value created and attributed to all stakeholders rather than just the shareholders. While the income statement reports on the income of shareholders, the value added statement (VAS) reports on the income earned by a large group of stakeholders, all the providers of capital plus employees and the government.

3.10 **STATISTICAL ANALYSIS**

3.10.1. **MEASURES OF CENTRAL TENDENCY**

While distributions provide an overall picture of some data set, it is sometimes desirable to represent some property of the entire data set using a single statistic. The first descriptive statistic we will discuss are those used to indicate where the ‘center’ of the distribution lies. It is not a value that has to be in the dataset itself. There are
different measures of central tendency, each with their own advantages and disadvantages.

**The Mode**

The mode is simply the value of the relevant variable that occurs most often (i.e., has the highest frequency) in the sample. However, that will not work when grouping was performed prior to plotting the histogram (although you can still use the histogram to identify the modal group, just not the modal value).

**Advantages**

- Very quick and easy to determine
- Is an actual value of the data
- Not affected by extreme scores

**Disadvantages**

- Sometimes not very informative (e.g. cigarettes smoked in a day)
- Can change dramatically from sample to sample
- Might be more than one (which is more representative?)

**The Median**

The median is the point corresponding to the score that lies in the middle of the distribution (i.e., there are as many data points above the median as there are below the median). To find the median, the data points must first be sorted into either ascending or descending numerical order.

**Advantage:**

- Resistant to outliers

**Disadvantage:**

- May not be so informative
- Does the value of 2 really represent this sample as a whole very well?
The Mean

The most commonly used measure of central tendency is called the mean (denoted for a sample, and \( \mu \) for a population). The mean is the same of what many of us call the ‘average’.

Mode vs. Median vs. Mean

When there is only one mode and distribution is fairly symmetrical the three measures (as well as others to be discussed) will have similar values. However, when the underlying distribution is not symmetrical, the three measures of central tendency can be quite different.

3.10.2. Measures of Dispersion

Measures of Dispersion (Variability) is used to describe how much spread there is in the distribution.

Common measures of Dispersion

- Range
- Interquartile distance
- Variance
- Standard deviation
- Coefficient of variation

The Range

The range of a set of data is the difference between its largest (maximum) and smallest (minimum) values.

Advantages:

- Easy to compute.
- Easy to understand.
- Scores exist in the data set
Disadvantages:

- Value depends only on two scores.
- Influenced by sample size.
- Very sensitive to outliers.
- Insensitive to the distribution of scores within the two extremes.

The Interquartile range

The central portion of the distribution, away from the extremes. Calculated as the difference between the third quartile (75%) and the first quartile (25%) of observations. Much of the data still discarded. Not simple to calculate.

Variance

Variance is a measure of the spread of a set of data with respect to the average value, or mean. Mathematically speaking, variance is the sum of the squared difference between each data point and the mean all divided by the number of data points.

Advantages:

- Takes all data into account.
- Lends itself to computation of other stable measures (and is a prerequisite for many of them)

Disadvantages:

- Hard to interpret.
- Unit is squared
- Can be influenced by extreme scores.

The Standard Deviation

The Standard Deviation: It is a standardized score which is the average deviation about the mean. It is the square root of the variance.
Advantages:

- Lends itself to computation of other stable measures (and is a prerequisite for many of them).
- Average of deviations around the mean
- Majority of data within one standard deviation above or below the mean.
- Not expressed in squared units, so makes more sense descriptively.

Disadvantages

- Influenced by extreme scores

Coefficient of Variation

The Coefficient of Variation: Coefficient of variation is the percentage measure of standard deviation to mean.

3.10.3. CORRELATION ANALYSIS

Good for understanding the relative variability in two characteristics of a population when characteristics are measured along very different numeric values.

Advantage

- An advantage of the correlation method is that we can make predictions about things when we know about correlations. If two variables are correlated, we can predict one based on the other.

Disadvantages

- Correlation research only uncovers a relationship; it cannot provide a conclusive reason for why there's a relationship. A correlative finding doesn't reveal which variable influences the other.

REGRESSION ANALYSIS

Regression analysis is a statistical process for estimating the relationships among variables. It includes many techniques for modeling and analyzing several variables, when the focus is on the relationship between a dependent variable and one or more independent variables.
Advantages

- Indicate if independent variables have a significant relationship with a dependent variable.
- Indicate the relative strength of different independent variables’ effects on a dependent variable.

Disadvantages

- Only Looks at Linear Relationships
- Sensitive to Outliers
- Data Must Be Independent
- Only Looks at the Mean of the Dependent Variable

3.10.4. TIME SERIES ANALYSIS

A time series is a sequence of data points, typically consisting of successive measurements made over a time interval. Time series forecasting is the use of a model to predict future values based on previously observed values.

Advantages:

- It is useful for identifying seasonal variations, which can help planning at different times of year
- It can reasonably accurate in short term if the firm is in stale environment

Disadvantage:

- It is long wided and complex process.
- Historical data is not always a good indicator of what will happen in further.
- It is not very useful for long term forecasting.

3.10.5 Analysis of variance (ANOVA)

Analysis of variance (ANOVA) is a collection of statistical models used to analyze the differences between group means and their associated procedures (such as "variation" among and between groups), developed by R.A. Fisher. In the ANOVA setting, the observed variance in a particular variable is partitioned into components
attributable to different sources of variation. In its simplest form, ANOVA provides a statistical test of whether or not the means of several groups are equal, and therefore generalizes the t-test to more than two groups.

3.10.6 CHI-SQUARE TEST

Chi-square is a statistical test commonly used to compare observed data with data we would expect to obtain according to a specific hypothesis. A chi square (X2) statistic is used to investigate whether distributions of categorical variables differ from one another. The Chi Square statistic compares the tallies or counts of categorical responses between two (or more) independent groups. Chi square test is also used as test of independence i.e. whether one variable is dependent on other or not.

3.10.7 KRUSKAL-WALLIS TEST

The Kruskal-Wallis test is a nonparametric test used to compare three or more samples. It is used to test the null hypothesis that all populations have identical distribution functions against the alternative hypothesis that at least two of the samples differ only with respect to location (median), if at all.

It is the analogue to the F-test used in analysis of variance. While analysis of variance tests depend on the assumption that all populations under comparison are normally distributed, the Kruskal-Wallis test places no such restriction on the comparison.

A One-Way ANOVA (Analysis of Variance) is a statistical technique by which we can test if three or more means are equal. It tests if the value of a single variable differs significantly among three or more levels of a factor.

3.10.8 T – test

Here in this study, the researcher has analysed various financial performance ratios based on CAMEL model and calculated ratios are further interpreted through T-test to analyse banks efficiency and returns and also to compare financial performance among selected public and private sector banks.
3.10.9 INDEX NUMBER

A statistic which assigns a single number to several individual statistics in order to quantify trends. The best-known index in the United States is the consumer price index, which gives a sort of "average" value for inflation based on price changes for a group of selected products. The Dow Jones and NASDAQ indexes for the New York and American Stock Exchanges, respectively, are also index numbers. Indicator of average percentage change in a series of figures where one figure (called the base) is assigned an arbitrary value of 100, and other figures are adjusted in proportion to the base.

3.10.10 DIAGRAMMATIC AND GRAPHICAL PRESENTATION OF DATA

Visualization techniques are ways of creating and manipulating graphical representations of data. We use these representations in order to gain better insight and understanding of the problem we are studying - pictures can convey an overall message much better than a list of numbers.

- Common Statistical Graphs
- Histogram -- vertical bar chart of frequencies
- Frequency Polygon -- line graph of frequencies
- Ogive -- line graph of cumulative frequencies
- Pie Chart -- proportional representation for categories of a whole
- Stem and Leaf Plot
- Pareto Chart
- Scatter Plot

3.11 MATHEMATICAL TECHNIQUES

3.11.1 PROGRAM EVALUATION AND REVIEW TECHNIQUE (PERT)

The program (or project) evaluation and review technique, commonly abbreviated PERT, is a statistical tool, used in project management, which was designed to analyze and represent the tasks involved in completing a given project.
3.11.2. CRITICAL PATH METHOD

The critical path method (CPM) is an algorithm for scheduling a set of project activities.

The Critical Path Method (CPM) is one of several related techniques for doing project planning. CPM is for projects that are made up of a number of individual "activities." If some of the activities require other activities to finish before they can start, then the project becomes a complex web of activities. CPM can help you figure out:

How long your complex project will take to complete. Which activities are "critical," meaning that they have to be done on time or else the whole project will take longer. If you put in information about the cost of each activity, and how much it costs to speed up each activity,

3. LINEAR PROGRAMMING PROBLEM

Linear programming (LP; also called linear optimization) is a method to achieve the best outcome (such as maximum profit or lowest cost) in a mathematical model whose requirements are represented by linear relationships. Linear programming is a special case of mathematical programming (mathematical optimization).

More formally, linear programming is a technique for the optimization of a linear objective function, subject to linear equality and linear inequality constraints.

3.12 CHAPTER PLAN

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3.12.1 DETAILED SCHEME OF CHAPTERS

CHAPTER 1 OVERVIEW: BANKING SECTOR AND FINANCIAL PERFORMANCE ANALYSIS
This chapter goes into the backyard of banking history in India, its evolution and growth post and pre freedom period. It gives basic idea about types of banks in India and their basic as well as major functions. Focusing on the crux of the study, this chapter highlights the process of banking supervision in India and in other countries, its process, methods and implementation.

CHAPTER 2 CAMEL MODEL: CONCEPTUAL FRAMEWORK
This chapter introduces and explains CAMEL model and the various ratios covered under it. The ratios which are taken for the purpose of study are explained in detail with their meaning and importance. Formula of such 18 ratios can be found in this chapter.

CHAPTER 3 RESEARCH METHODOLOGY
The methodology used for the study is discussed in this chapter. This chapter explain research design of the study, statement of the research problem, objectives of the study, scope and population of the study. It also covers 18 hypothesis formulated for testing under t-test analysis. A descriptive literature review covers significant part of the chapter and at last various tools and techniques of research have been discussed. This chapter is the heart of the study.

CHAPTER 4 PROFILE OF SELECT BANKS
This is a chapter completely based on secondary information collected from the official websites of banks and reserve bank of India website. The chapter covers brief introduction, history
and development of 19 public and 19 private sector banks taken as sample under this study.

CHAPTER 5  DATA ANALYSIS AND INTERPRETATION
If Chapter 3 is the heart of this study, this chapter is the mind of this study. The chapter is basically crafted in 18 sections for 18 ratios covered under this study. Each section has 4 main points under it i.e. Explanation of Ratio and hypothesis, T-test analysis table and results, interpretation in words and chart and comparative tables of ratios for six years for all 19 banks.

CHAPTER 6  FINDINGS AND SUGGESTIONS
This chapter presents summary of interpretations and conclusions derived at in chapter 5. Not only this, the chapter highlights major findings and recommendations of the study that can be taken as guideline for further study on the related topics. The chapter ends with major limitations leading to the scope of further research.
3.13 LIMITATIONS OF THE STUDY
“Financial Performance Analysis through CAMEL FRAMEWORK of selected public and private sector banks”, following are the limitations of our research study.

- This study is limited to six years information of the select banks only
- The study is completely based on the ratios calculated from the balance sheets, profit and loss account and other financial statements and reports.
- This study covers only select financial performance parameters covered under CAMEL framework and does not take all possible financial factors.
- The study is limited to select 19 private and 19 public sector banks only.
- Time and resource constraints
- The method discussed pertains only to banks though it can be used for performance evaluation of other financial institutions.
- The study is based on secondary data only.

Thus, above all are limitations during our research study. Despite of these limitations research work is accurate which measures financial performance of the banks.

3.14 SUGGESTIONS
Considering the practical implications and overall findings and conclusions, suggestions are given at the end of the study to assist research scholars for doing further research on the related topics.
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