CHAPTER - 3
RESEARCH METHODOLOGY

Research methodology is a way to analytically solve the research problem. It may be understood as a science of studying how research is done scientifically using an explicit research design. A research design can be explained as the “detailed blueprint used to guide a research study towards its objectives” (Aaker, Kumar and Day, 2003). Research design provides the “glue that holds the research together. A design is used to structure the research, to show how all of the major parts of the research work together to address the research questions”. Research mainly focuses on selection and formulation of research problem and formulating hypotheses to draw conclusions by applying various statistical tools. The present chapter consists of statement of the problem, research objectives, hypotheses, techniques of data collection and statistical methods to analyse the collected data.

3.1 Statement of the problem

Indian financial system comprises of various pillars out of which banking sector said to be the apex one. After the reforms of 1991, private sector banks and foreign banks were allowed to enter into the Indian banking industry either in the form of branches or subsidiary. The entry of private sector banks and foreign banks proved to be a milestone in Indian banking industry due to the introduction of competition. The new entrants came up with new technologies and new chain of operational methods. The consequence of all the reforms was evolution of competitiveness in banking industry as the monopoly of public sector banks came to an end. Earlier, public sector banks were the only players in Indian banking industry. Now they had to compete with their rivalry in the market. Competitiveness now became vital for survival of banks in the banking industry. Concentration and competitiveness both have been used as similar terms. Now the question arises why the present study has been undertaken? The present study has been undertaken to study
competitiveness of whole banking industry because banking sector directly impacts the economy of a country. The more the competitiveness, the more it is beneficial for the economy. Hence, it has become essential to find out the trend in competitiveness of Indian banking industry. Moreover, it’s been need of the hour to know whether only big banks hold all the assets, deposits and advances through the study period or the concentration has reduced over the time period. Though, literature review supported the fact that various studies have been performed that explained the competitiveness at global level, these studies included competitiveness of countries, companies in global environment but it lacks a comprehensive aspect regarding banking sector especially Indian banking sector. Moreover most of the studies were conducted by taking few banks either public sector banks or private sector banks and their comparative study. By taking into consideration all the above facts, the present study focused on measuring the competitiveness, concentration and financial performance of Indian banking sector with special reference to Scheduled Commercial Banks except regional rural banks.

3.2 Objectives of the study:

1) To measure the competitiveness of Scheduled Commercial Banks in India.

2) To evaluate the financial performance of Scheduled Commercial Banks in India.

3) To study the impact of competitiveness on the financial performance of Scheduled Commercial Banks in India.

3.3 Research Hypotheses:

H₀₁: There is no significant increase in the competitiveness of Scheduled Commercial Banks during the period of study.

H₀₂: There is no significant impact of competitiveness on the financial performance of SBI and its Associates.
H03: There is no significant impact of competitiveness on the financial performance of other public Sector banks.

H04: There is no significant impact of competitiveness on the financial performance of private Sector banks.

H05: There is no significant impact of competitiveness on the financial performance of foreign banks.

3.4 Research design:

Descriptive research design has been used in the present study. Descriptive in the sense it explains a pre-dominant phenomenon regarding performance and concentration of Scheduled Commercial Banks.

3.4.1 Sample size for the present study:

The present study has been performed on Scheduled Commercial Banks in India. On the basis of ownership Scheduled Commercial Banks in India can be grouped into five different groups- (a) State Bank of India & its Associates, (b) Other Public Sector Banks, (c) Private Sector Banks, (d) Regional Rural Banks, (e) Foreign Banks. In the present study, all the SCBs have been taken except Regional Rural Banks. RRBs have been excluded from the study because they have narrow sphere of operations.

3.4.2 Data collection:

The present study has been based on secondary data. Secondary data has been taken from various sources. The time frame for present study includes twelve years i.e. 2004-05 to 2015-16. The data regarding all the variables and ratios have been taken and compiled from Database on Indian Economy, consisting Statistical tables relating to banks in India; published by RBI, moneycontrol.com, capitaline and from the official website of Indian Banks Association. After collecting all the required data, the normality of data has been checked. Normality has been checked to decide the statistical tests to be applied on the data i.e. either parametric or non-parametric.
3.4.3 Normality check for secondary data:

Normality of the data has been checked with the help of normality tests.

Table 3.1 Tests of Normality

<table>
<thead>
<tr>
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<th>Kolmogorov-Smirnov</th>
<th>Shapiro-Wilk</th>
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<tbody>
<tr>
<td></td>
<td>Statistic</td>
<td>Df</td>
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<tr>
<td>Asset</td>
<td>.350</td>
<td>40</td>
</tr>
<tr>
<td>Deposit</td>
<td>.180</td>
<td>40</td>
</tr>
<tr>
<td>Advances</td>
<td>.162</td>
<td>40</td>
</tr>
</tbody>
</table>

For the undertaken study, Shapiro Wilk test has been used. Shapiro Wilk test is used when the size of the data is <2000 if the data is > 2000, value of kolmogorov-smirnov is considered for checking the normality. The values of Shapiro Wilk for assets, deposit, advances and net profit came out as .000, .000, .000 respectively. All the values were < .005 and were found to be normally distributed and accepted at 5% level of significance which proved that the data is fit for parametric tests.

3.5 Data analysis

The secondary data has been analysed using software like MS-Excel and Statistical Package for Social Sciences (SPSS) version 20.0. In order to analyse the data, various statistical techniques have been applied which have been discussed below

Compound growth model

Compound annual growth rates of some of the variables under consideration were also calculated. It is an average growth rate over a period of time CAGR was calculated by using following formula:

\[
CAGR = [AL \{ \Sigma \log X/n \}] - 100
\]

Where, AL= Anti-logarithm
Log X= log of the performance index of concerned variable at base 10, n = number of years
Index of Competitiveness (Herfindahl-Hirschman Index)

In order to examine the competitiveness in a particular industry, different researchers have used different indices. Through the review of literature, it has been observed that Herfindahl-Hirschman Index (henceforth, HHI) has been the widely used tool to measure competitiveness through measuring market concentration. HHI has been the most commonly used index in European Union and US. After review of literature, HHI model has been implemented using three variables: Assets, Deposits and Advances. HHI measures the concentration in the industry. HHI is calculated by squaring the market share of each firm in the market. High concentration leads to less competitiveness.

The formula used for calculation of HHI as follows:

$$HHI = \sum_{i=1}^{n} S_i^2$$

Where, ‘$S_i$’ denoted market share of $i^{th}$ firm in the market, ‘$n$’ denoted no. of firms in the market. Values obtained after using the index have shown the competitiveness of Indian banks. As per the review of literature, to categorize the level of competitiveness, a standard benchmark has been followed as given below by the U.S. Department of Justice:

- $HHI<0.15$ Competitive
- $0.15<HHI<0.25$ moderately concentrated
- $HHI>0.25$ highly concentrated

**K-Bank Concentration Ratio**

Concentration ratios are used to show the extent to which a large firm controls the market and also depicts the level of competition. Most commonly used concentration ratios are $CR_4$ and $CR_8$ that means the share of four largest firms in the industry and eight firms in the industry respectively. These ratios are quite simple to use and require limited data. In banking industry, these ratios are very popular to find out the competition pattern. K- bank
concentration ratio depicts the combined market share of the K largest firms in the market. Concentration ratio takes the following form:

$$ \text{CR}_k = \sum_{i=1}^{k} S_i $$

Where $S_i$ denotes the share of each bank, $k$ denotes the number of banks.

The higher values depict the low level of competitiveness. The values approaching unity depicts monopoly in the market or we can say, a single firm controls the market and vice-versa.

**CAMEL Model**

CAMEL model is based on ratios of a bank and is always desirable to evaluate the financial performance of banks. The main objective of this model is to measure the performance by ranking the banks.

There are total five constituents of CAMEL model namely: Capital Adequacy, Asset Quality, Management Efficiency, Earning Quality and Liquidity. The above constituents are discussed below:

**I Capital Adequacy:** Capital adequacy is important for a bank to have depositor’s confidence and for prevention of bank from bankruptcy. Capital is considered as a protection shield for depositors and it is required to promote stability of a financial system. Capital adequacy reflects the overall financial state of the banks and also the capability of the management to convene the requirement for supplementary capital. It also indicates whether the bank has enough capital to take up unanticipated fatalities. Capital adequacy ratio acts as a dial of bank leverage. The following ratios are used to measure Capital Adequacy:

**I (a) Capital Adequacy Ratio:** The banks are required to maintain the Capital Adequacy Ratio (Henceforth, CAR) as specified by RBI from time to time. As per the latest RBI norms, the banks in India should have a CAR of 10%. It is arrived at by dividing the sum of Tier-I & Tier-II capital by
aggregate of Risk Weighted Assets (RWA) Symbolically \( \text{CAR} = \frac{(\text{Tier I} + \text{Tier-II})}{\text{RWA}} \) • Tier - I capital includes equity capital & free reserves • Tier - II capital comprise of subordinate debt of 5-7 years tenure, revaluation reserves, general provisions and loss reserves, hybrid debt capital instruments and undisclosed reserves and cumulative perpetual preference shares.

I (b) Advances to Assets Ratio: Advances to Assets is the ratio of the total advances to total assets. This ratio indicates a bank's aggressiveness in lending which ultimately results in better profitability. Higher ratio of advance/assets is preferred to a lower one. Total advances also include receivables. The value of total assets excludes the re-evaluation of all the assets.

I (c) Govt Securities (G-Secs) to Total Investments Ratio: To show the risk taking ability of the bank, the percentage of government securities in total investment is calculated. This ratio is very important indicator of the bank’s strategy that whether the bank follows high profit-high risk or low profit-low risk strategy. In addition to that the ratio depicts the availability of alternate investment opportunities. The government securities are considered to be the safest debt instrument which in turn provides the lowest returns. Being free from risks, higher the investment in government securities, the lower is the risk of returns.

II Assets Quality: The quality of assets is an important parameter to determine the strength of the bank. The prime adage behind measuring the assets quality is to ascertain the component of Non-Performing Assets (NPA) as a percentage of the total assets. This indicates the ability of bank to recover its advances. The following ratios are necessary to assess the asset quality:

II (a) Net NPAs to Total Assets Ratio: This ratio assesses the efficiency of the bank in credit risk and to which extent it can recover the debts. The ratio is calculated by dividing the Net NPAs by Total Assets. Total assets
considered in the present ratio are net of revolution reserves. The Lower the ratio the better is the performance of the Bank.

**II (b) Net NPAs to Net Advances Ratio:** It is the most standard measure of assets quality. In this ratio, Net NPAs are measured as a percentage of Net Advances.

**II (c) Total Investments to Total Assets Ratio:** This ratio indicates the deployment of assets in investment. The ratio depicts the percentage amount of total assets locked up in investments but that does not form part of core income of the bank. The ratio is arrived at by dividing total investments to total assets. A bank is said to be conservative if the ratio values comes out to be higher. Though, the higher ratio reduces the profitability of bank.

**III Management Efficiency:** The vital element of CAMEL model is management efficiency. The present constituent measures the efficiency and effectiveness of management. The management of any bank is always liable for the decisions it takes for risk management. To gauge the performance of better quality banks and also the poor ones, this constituent is used. The following ratios are used to evaluate the management efficiency.

**III (a) Total Advances to Total Deposits Ratio:** The ability of a bank in converting the deposits in high earning advances is evaluated through the ratio total advance to total deposits. Total Deposits take account of demand deposits, saving deposits, term deposits and deposits of other banks. Total Advances also embrace with the receivables.

**III (b) Return on Equity (ROE) Ratio:** return on equity is the net income returned as a proportion of shareholders worth. It depicts the ability of a management in earning profit on the money invested by shareholders. Return on Equity can be explained as:

\[
\text{ROE} = \frac{\text{Net income}}{\text{shareholder's worth}}
\]
III (c) **Profit per Employee Ratio**: This ratio indicates the profit earned per employee by the bank. It is calculated by dividing the Profit after Tax (PAT) earned by the bank to the total number of employees working in the bank. The higher values of ratio depict the overall efficiency of management.

**IV Earning Quality** The consistency of a bank’s earning is an important criterion to judge the quality of earning. It basically determines the profitability of the banks. It also explains the sustainability and growth in earnings in the future. The parameter gains significance as a hefty part of a bank's income is earned all the way through non-core activities like investments, treasury operations, and corporate advisory services. The quality of income is gauged by following ratios:

**IV (a) Spread or Net Interest Margin (NIM) to Total Assets Ratio**: Net interest Margin is the difference between the interest income and the interest expended as a percentage of total assets, demonstrates the ability of the bank to maintain the interest on deposits on the lower side and interest on advance on the higher side. It is a chief measure of a bank’s core income (income from lending operations). The higher spread depicts the better earnings provided the total assets. Dividend income is included in the interest income while interest on deposits and loans are considered under interest expended.

**IV (b) Percentage growth in Net Profit Ratio**: net profit is considered as an essential parameter to judge the earning quality of a bank. Similarly, percentage change in net profit depicts how much change in the net profit happens during the time period and also whether the change is positive or negative. The higher positive change is considered to be the best. Moreover, higher positive change depicts the ability of management to earn in better way and the bank is said to be profitable.

**IV (c) Non-Interest Income to Total Assets Ratio**: Adapting new technologies and the innovative products are the two keys through which
banks earn fee based income. Fee based income forms a major part of a bank’s earning. The capital adequacy is not only the factor on which the stream of revenues of a bank depends upon but also its potential to generate income. Moreover, this ratio evaluates the income from operations, other than lending, as a proportion of total income. Non-interest income is calculated as the income earned by the banks minus income on advance and deposits with the RBI. The higher ratio of non-interest income/total income depicts the increment in share of fee-based income.

V  Liquidity

Liquidity being important facet for any organization that deals in money. Banks have to be very attentive while hedging liquidity risk and at the same time they must ensure that a good percentage of funds are invested in avenues that generate high returns so as to earn profit while providing liquidity to the depositor. The most liquid assets for a bank are its assets and cash investments. The following ratios are calculated to measure liquidity:

V (a) Liquid Assets to Total Assets Ratio: Liquid assets embrace cash in hand, balance with the RBI, balance with other banks (both in India and abroad) and money at call and short notice. Total assets take in the revaluations of all the assets. The part of liquid assets to total assets depicts the overall liquidity position of the bank.

V (b) Government securities to Total Assets Ratio: Government securities tend to be the most liquid and risk free investments. This ratio measures the Government Securities as a fraction of total assets. Banks invest in government securities principally to meet their SLR requirements, which are around 25% of net demand and time liabilities. Moreover, this ratio measures the risk involved in the assets held by a bank.

V (c) Liquid Assets to Demand Deposits Ratio: The ratio measures the ability of a bank in meeting the demand from deposits in an exacting year. It is determined by dividing the liquid assets to the total demand deposits. High
liquidity to the depositor is offered by the demand deposits. Moreover, banks have to invest their money in the high liquid assets. The liquid assets comprise cash in hand, balance with the RBI, balance with other banks (both in India and abroad), and money at call and short notice.

V (d) Liquid Assets to Total Deposits Ratio: This ratio is an instrument to find the available liquidity to the deposits of a bank. Total deposits consist of demand deposits, saving deposits, term deposits and deposits of other financial institutions.

Multivariate Linear Regression Model

It has been essential to ensure whether competitiveness yields any impact on financial performance of banks in India or it is insignificant. For finding out the same, multivariate linear regression has been used. The study results revealed that both the competitiveness and financial performance of Scheduled Commercial Banks in India has amplified but the question arisen whether the increased financial performance has been an impact of competitiveness or some other factors. As the financial performance has been dependent factor with more than one variable led to apply Multivariate Linear regression in the study. Multivariate Linear Regression somehow same as linear regression but different from multivariable linear regression or multiple linear regression. In case of multiple linear regressions there exists scalar vector i.e. there exists one dependent variable and multiple independent variable. In certain situations, there has to be checked the impact of one independent variable on multiple correlated dependent variables, for such cases multivariate linear regression has to be applied. Multiple linear regression consider the relationship between one independent variable and more than one dependent variables. In the present study, multivariate linear regression has been applied to the dataset with the help of SPSS. In the present study, the dependent and independent variables have been identified as below:
Table 3.2 Variables for Multivariate Linear Regression

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<th>Independent Variable</th>
<th>Dependent Variables</th>
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<tbody>
<tr>
<td>Index of Competitiveness (HHI)</td>
<td>✤ Capital Adequacy Ratio</td>
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<td>✤ Advances to Assets Ratio</td>
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<td>✤ Government Securities to Total Investment</td>
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<td>✤ Liquid Assets to Total Assets Ratio</td>
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3.6 Significance of the study:

The present study was focused on the competitiveness of banks in India and the impact of competitiveness on their financial performance. The study was confined only to Indian banking industry. Only the Scheduled Commercial Banks have been selected for the study. The study has focused on concept of competitiveness and its measurement too. Secondary data has been analysed to check the competitiveness of all the Scheduled Commercial Banks and their financial performance. The present study will be an addition to the prevalent knowledge because very few studies have been conducted in India using the parameters used in the present study.
3.7 **Organization of the study:**

The study has been organized in the following manner:

Chapter 1  Introduction

Chapter 2  Review of Literature

Chapter 3  Research Methodology

Chapter 4  Competitiveness of Scheduled Commercial Banks in India

Chapter 5  Financial Performance of Scheduled Commercial Banks in India

Chapter 6  Impact of Competitiveness on the Financial Performance of Scheduled Commercial Banks in India.

Chapter 8  Findings, Suggestions and Conclusion

**Concluding Remarks**

This chapter has detailed about the research problem, objectives of research, hypotheses formulation, variables used and reasons for their selection. In addition to, the chapter has explained the methodology, tools and techniques and the software used for generating the output. In the upcoming part, the outputs of the objectives has been interpreted.