Chapter IV

RESEARCH DESIGN

This chapter gives a detailed discussion on the research design that is employed for this study. Models like ‘CAMEL’ used for measurement of financial condition of banks, econometric models for analysis of the profitability and efficiency of banks, econometric models used for examining the correlation between technological change with efficiency and risk management etc. are discussed in this chapter. Various financial ratios and other parameters used for the above analyses, along with their definitions, are also included in this chapter.

4.1. Measuring the Financial Position of OPBs: The ‘CAMEL’ Model

As already discussed in Chapter III (Theoretical Framework), the ‘CAMEL’ model is used for measuring financial position (stability) of the OPBs in India. As already discussed in Chapter III, totally eighteen ratios are selected under five major groups (viz. C,A,M,E, and L) are used for analysis. Accordingly, 2, 3, 4, 7 and 2 ratios each are selected for the variables C, A, M, E and L respectively. (Table 3.1, Chapter III). The methodology involved in arriving at the final ‘CAMEL’ rating is discussed below.

Step I: Finding the Individual Scores for the various Ratios

In this step, values of the 18 individual ratios in respect of each of the ten years under study (FY 2000 to FY 2009) are found first. This is done separately for each of the Old Private sector Banks (OPBS) in India and not just for the four Kerala-based Old Private sector Banks (KOPBs) under focused study viz. (i) Catholic Syrian Bank (CSB), (ii) Dhanalakshmi Bank (DB), (iii) Federal Bank (FB), and (iv) South Indian Bank (SIB)

Step II: Finding the Group Level Scores for the various Ratios

Under this step, the individual scores obtained in respect of the various ratios in Step I above are averaged to get the group level scores. To be specific, the average of the two ratios under Capital Adequacy parameter (parameter ‘C’ in the CAMEL model) would
give a group level score for ‘C’. Likewise, the values of the three ratios under Asset quality (parameter ‘A’ in the CAMEL model) when averaged would give a group level score for ‘A’. Similar procedure is followed for M (four ratios), E (seven ratios) and L (two ratios) to arrive at the respective group level scores. Here, equal weights are given for all ratios under all groups and thus a simple average methodology is used.

**Step III: Finding the Overall Composite Scores (CAMEL Ratings) for the Banks**

Under this step, the overall composite scores (CAMEL Scores or CAMEL Ratings) are arrived at, from the individual scores obtained from Step II above, giving equal weightage for all the five groups (parameters of CAMEL viz. C,A,M,E and L). Thus, CAMEL scores of all OPBs in India are found in this step.

**Step IV: Benchmarking the Status of KOPBs among OPBs in CAMEL Ratings**

Here, based on the values of the CAMEL scores the performance of KOPBs are benchmarked. For this, using the mean and standard deviation (SD) values of the CAMEL scores, all the 15 OPBs are classified into four quartiles (each representing 25 percent of the total population). Then the relative position of the KOPBs are found, as to under which of the four quartile do they fall.

### 4.2. Profitability and Efficiency of OPBs: An Econometric Model

As already discussed in Chapter III, Operating Profit Ratio (OPR) and Net Interest Margin (NIM) are used as the measures of Profitability and Efficiency of the OPBs. Thus, OPR and NIM are the dependent variables chosen. Based on the economic rationale discussed in Chapter III, the five explanatory variables chosen are as follows:

1. ASST – representing the value of Total Assets (Logarithm),
2. PRIOR – ratio of the Priority sector advances to Total Assets,
3. GSEC – ratio of investments in Government Securities to Total Assets,
4. NOM – ratio of Non-interest income to Total Assets, and
5. RURAL – ratio of rural and semi-urban branches to urban and metro branches.
The econometric model for OPR may be expressed as follows:

\[
OPR = \alpha_1 + \alpha_2 (\text{ASST}) + \alpha_3 (\text{PRIOR}) + \alpha_4 (\text{GSEC}) + \alpha_5 (\text{NOM}) + \alpha_6 (\text{RURAL}) + \varepsilon
\]

where, \( \alpha_i \) is the estimated coefficients (\( \alpha_1 \) is the intercept term, a constant) and \( \varepsilon \) is the error term. (Here, the dependent variable OPR is defined as the ratio of Operating profits to Total Assets).

The econometric model for NIM may be expressed as follows:

\[
NIM = \beta_1 + \beta_2 (\text{ASST}) + \beta_3 (\text{PRIOR}) + \beta_4 (\text{GSEC}) + \beta_5 (\text{NOM}) + \beta_6 (\text{RURAL}) + \mu
\]

where, \( \beta_i \) is the estimated coefficients (\( \beta_1 \) is the intercept term, a constant) and \( \mu \) is the error term. (Here, the dependent variable NIM is defined as the Net Interest Margin or the ratio of Net Interest Income to Total Assets).

Methodology

Using the econometric models discussed above, regressions runs are performed using the popular statistical package SPSS (Version 16.0), separately for OPR and NIM. The above exercise is done for:

1. The four Kerala-based Old Private sector Banks (KOPBs) under focused study viz. (i) Catholic Syrian Bank (CSB), (ii) Dhanalakshmi Bank (DB), (iii) Federal Bank (FB), and (iv) South Indian Bank (SIB);
2. All Old Private Sector Banks (OPBs)\(^1\) in India (taking their average figures); and
3. All New generation Private sector Banks (NPBs)\(^2\).

Here, OPBs and NPBs are included in order to make a meaningful comparison with KOPBs and for tracing the general performance trend of the respective bank groups.

\(^1\) Only 15 OPBs which have been functioning throughout the 10 years’ period under study are considered.
\(^2\) Only 4 NPBs which have been functioning throughout the 10 years’ period under study are considered.
4.3. Technology and Its Impact on Operational Efficiency and Risk Management of OPBs: An Econometric Model

As already discussed in Chapter III, NIM and NOM may be taken as the dependent variables for assessing the Operational Efficiency and Risk Management of OPBs. Here, NIM is defined as the Net Interest Margin or the ratio of Net Interest Income to Total Assets. Likewise, NOM is defined as the Non-Interest Margin or the ratio of Non-Interest Income to Total Assets.

Based on the economic rationale discussed in Chapter III, the five explanatory variables chosen are defined as follows:

(1) RISK: It represents the variability in returns. It is defined as the Return on Assets (ROA) for the bank or the bank group for a given year divided by the mean ROA of the same bank or the bank group for all the years under study. (For example, for FY 2007 it is ROA for FY 2007 divided by mean ROA for all the ten years under study viz. FY 2000 to FY 2009.

(2) COP: Or, Cost of Production, is the ratio of Operating expenses to Total Assets.

(3) REG_COST: Or, Regulatory Cost is defined as the ratio of Total Capital of the bank to its Total Assets.

(4) TECH_CHG: It represents the Technological Change and is taken as the ratio of non-interest income to net-interest income – a close proxy for investments in technology by banks.

(5) NPA: It represents the quality of assets and is defined as the ratio of Net NPAs to Net Advances.
The econometric model for NIM may be expressed as follows:

\[
NIM = \alpha_1 + \alpha_2 (RISK) + \alpha_3 (COP) + \alpha_4 (REG\_COST) + \alpha_5 (TECH\_CHG) + \alpha_6 (NPA) + \varepsilon
\]

where, \( \alpha_i \) is the estimated coefficients (\( \alpha_1 \) is the intercept term, a constant) and \( \varepsilon \) is the error term. (Here, the dependent variable NIM or Net Interest Margin is defined as the Net Interest Income to Total Assets).

The econometric model for NOM may be expressed as follows:

\[
NOM = \beta_1 + \beta_2 (RISK) + \beta_3 (COP) + \beta_4 (REG\_COST) + \beta_5 (TECH\_CHG) + \beta_6 (NPA) + \mu
\]

where, \( \beta_i \) is the estimated coefficients (\( \beta_1 \) is the intercept term, a constant) and \( \mu \) is the error term. (Here, the dependent variable NOM or Non-Interest Margin is defined as the Non-Interest Income to Total Assets).

**Methodology**

Using the econometric models discussed above, regressions runs are performed using the popular statistical package SPSS (Version 16.0), separately for NIM and NOM. The above exercise is done for:

1. The four Kerala-based Old Private sector Banks (KOPBs) under focused study viz. (i) Catholic Syrian Bank (CSB), (ii) Dhanalakshmi Bank (DB), (iii) Federal Bank (FB), and (iv) South Indian Bank (SIB);
2. All Old Private Sector Banks (OPBs)\(^3\) in India (taking their average figures); and
3. All New generation Private sector Banks (NPBs)\(^4\).

Here, OPBs and NPBs are also included along with KOPBs in order to make a meaningful comparison with KOPBs and for tracing the general performance trend of the respective bank groups.

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\(^3\) Only 15 OPBs which have been functioning throughout the 10 years’ period under study are considered.

\(^4\) Only 4 NPBs which have been functioning throughout the 10 years’ period under study are considered